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ABSTRACT

This document contains 23 papers on European trends in vocational education and training (VET) and the development of occupations and qualifications. The following papers are included: "Vocational Socialisation and Competence Development: The Historical Dimension" (Walter R. Heinz); "European Trends in the Development of Vocational Education and Training Systems and Provision" (Tom Leney, Andrew Green, and Alison Wolf); "Competence Development and the Environment: the Contribution to Job Creation" (Catherine Gay); "The Local and Regional Dimension: Qualifications and Skills Needs Analysis as a Basis of VET Planning" (Mario Gatti, Claudio Tagliaferro, and Maria Grazia Mereu); "Low Skills--How the Supply Is Changing across Europe" (Hilary Steedman); "Trends in Occupations and Qualifications: Upgrading Versus Bumping Down" (Lex Borghans and Andries de Grip); "The Impact of Information and Communication Technologies (ICTs) on the Development of Occupational Skills and Training Needs" (Lazaro Gonzalez); "Foreseeable Developments in Occupations and Qualifications against the Background of New Information and Communication Techniques" (Werner Dostal); "The Structuring of Vocational Qualifications in France and Germany: Institutional Coordination Systems" (Martine Mobus and Eric Verdier); "The

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Acquisition of Skills and Qualifications for Lifelong Learning, Trends and Challenges across Europe" (Graham Attwell, Alan Brown); "Continuing Vocational Education and Training--Initial Responses to Trends in Occupations and Qualifications" (Hartmut Seifert); "Trends in Competence Development in European Companies" (Barry Nyhan); "Skill and Competence Needs of Small and Medium-Sized Enterprises (SMEs) and for the Creation of New Companies" (John Konrad); "New Developments in Qualification Strategies for Sectoral and Regional Innovation" (Loek F.M. Nieuwenhuis); "Trends in Learning Foreign Languages within VET, the Leonardo da Vinci Programme and the Acquisition of Foreign Languages" (Sieglinde Gruber, Jean-Claude Lasnier, Bernd Ruschoff, et al.); "Surveys and Analysis Projects of the Leonardo da Vinci Programme: Quantitative and Qualitative Analysis of the 1995, 1996, and 1997 Calls for Proposals with a Special Attention to Projects on 'Anticipation of Qualifications and Competencies'" (Marc Ant and Jeff Kintzele); "Anticipation of Qualifications and Competencies--Main Outcomes of Selected Leonardo da Vinci Projects" (Burkart Sellin); "Prospects and Possibilities for European VET-Research" (Michael Kuhn and Erhard Schulte); "Strategies and Scenarios for the Development of (Continuing) VET" (Fons van Wieringen); "Aims, Working Methods and Subjects" (Stavros Stavrou); "Current Activities and Outcomes" (Burkart Sellin); "Impact of Information and Communication Technologies on Occupational Competencies and VET" (Mara Brugia); and "Learning in Microenterprises, Some Sectoral Aspects" (Tina Bertzeletou). Many papers include substantial bibliographies. (MN)

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Volume II

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Volume II

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Volume II

CEDEFOP – European Centre for the Development of Vocational Training

Burkart Sellin, CEDEFOP (ed.)

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Preface

The question of trends in occupations and qualifications affects everybody, but in particular those with responsibilities relating to education and training policy development. This is the case in the Member States and their regions, in the social partner organisations, and in the relevant EU institutions: the European Parliament, the Council and the European Commission, the Economic and Social Committee, and the Committee of the Regions.

In the past few decades, education and training have acquired a high status in European countries. In particular, in the wake of the structural change in the world of work and in trade and industry, in the wake of internationalisation and globalisation, and in view of the increasing penetration of 'technology' into social and cultural life, the structures of, and courses offered by, training and further training are playing an increasingly important role. Earlier rigidities, which still characterise education and training systems all too often today, are now being called increasingly into question as a result of this technological penetration.

The separation between education and training, technical/practical training and theoretical/academic education, application-oriented training and technical training with an academic basis, etc., is increasingly being overtaken by this trend.

The time when work was rigidly divided into executive and conceptual, intellectual and practical, intellectual and technical intelligence, would appear to be over. The division into 'two cultures', one based on the humanities and one on science and technology, which had already appeared to be artificially maintained, is now beginning to waver. In industry and in the field of personal services, routine work, assembly line work and purely auxiliary activities have in many cases become obsolete in the EU with the aid of technology and of the new forms of work organisation it makes possible. As a result of extensive capital investment, the jobs of blue- and white-collar workers with minimal qualifications have been replaced, to a significant extent, by machines.

Since the mid-1960s, many of the more demanding jobs of qualified skilled workers and craftsmen have also been performed automatically by machines, robots, flexible production systems, etc.

Since the early 1980s, with the increasing dissemination of computer applications and the construction and expansion of new information and communications systems, i.e. with the emergence of the information society, a new stage of development now appears to have been reached. Even intellectual work — the work of architects, artists and designers, mathematicians and physicists, journalists and publicists, lawyers and economics experts — is, in principle, becoming accessible and permanently available to all men and women. Many people can teach themselves the necessary skills via relatively simple programs and can learn the relevant computer applications. In other words, the sum of knowledge and the sum of human skills and capacities with reference to the current state of the art will very soon be available everywhere, at all times.

Admittedly, this new stage of development has only just begun. However, it is already becoming apparent that a large proportion of the knowledge and skills of highly-qualified professionals has now begun making its way into 'machines'. There is a tendency too for them to be similarly threatened by rationalisations, as is already largely the case, with their help, with blue- and white-collar workers with lower-level qualifications.

Meanwhile, less of a change is apparent in the unequal distribution of opportunities as regards access to education, training and employment, based on social and geographical characteristics and background. Similarly, children and young people whose parents are blue- or white-collar workers with minimal qualifications still have different opportunities in terms of advancement, participation and employment.

On the basis of expert scientific analyses and conclusions, this publication will concentrate

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on concrete trends and the associated challenges, which are currently arising and are set to continue in the medium term, against this background. Its aim is to provide suggestions for necessary and desirable developments in programmes of education and training/further training, and to explain the institutional structures that are required in order to progress developments proactively, in a way that is realistic in both social and economic terms.

The decisive trends in the development of occupations and qualifications described in Volumes I and II of this reference publication appear to be obvious. It is time to draw the necessary conclusion from them in terms of policy and practice. In February 1999, the European Parliament adopted a resolution on the creation of jobs with future prospects (¹), which makes it clear that there is genuine awareness of the relevant consequences for policy, but that there still appears to be a major deficit in terms of implementation. The chapter on employment in the Treaty of Amsterdam and the national employment plans submitted by governments with a view to combating unemployment also underline this point.

Science and research, which will be dealt with in Volume II in particular, have made crucial progress over the past few years. The labour market and occupational research and research into education and training have now obtained a rich store of knowledge. This will now be brought together at European level and made available to a wider public, the first time this subject has been covered in such a comprehensive way.

The three volumes now presented continue Cedefop's endeavours to make available to policy-makers and practitioners research findings and formulations on key issues of education and its development. This was done with the publication of Cedefop's first report on research into and development of vocational education and training 'Training for a changing society', in 1998, which covered a vast range of topics.

Volume I of the current publication summarises, in a convenient form, important findings of relevance to policy and practice. In Cedefop's view, they are of fundamental importance to the development of vocational and educational training (VET) and further education/training in Europe in the next few years, against the background of the research it has carried out and the findings it has obtained over the past few years, and particularly in the context of the thematic network with the same title (²).

As many of the contributions make clear, Europe is not as varied as it is always made out to be. In some cases, the regional and sectoral differences and the differences between particular occupational groups and training levels are greater within a particular country than are the differences between countries, e.g. in comparable regions and sectors or occupational groups. The most significant trends are largely comparable in terms of their key features. Despite continuing cultural differences within the EU, the value systems with regard to education and occupations also appear to be tending to become more similar. The dissemination of information and the increasing speed of communications know no bounds and are leading to increased agreement and improved understanding across language barriers.

A common European education and qualification area is coming into being in parallel to a common labour market. Today's young people have a far more positive attitude to geographical mobility in Europe than did the preceding generation, particularly if they are well-qualified or aiming to achieve higher qualifications.

The authors of the expert contributions to Volume II were commissioned by Cedefop to provide brief summaries of the most significant results of their research. Volume II takes the

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(¹) Cf. European Parliament (1999): *Resolution on the creation of jobs with future prospects*, adopted on 8 February 1999 on the basis of the report by Thomas Mann MEP.

(²) Circle for research cooperation on 'European Trends in Occupations and Qualifications', Ciretoq.

form of a scientific manual. The recommendations included in the two volumes are not necessarily all on the same level, but complement one another and should be regarded in this light. While in Volume I general conclusions are drawn and relatively abstract recommendations made, essentially on the basis of the expert knowledge compiled in Volume II, the majority of the expert recommendations in Volume II are more in-depth and develop their conclusions on the basis of concrete research issues, some of them comparative and some geared to a specific country. This is done with the aid of appropriate quantitative and qualitative methods, which are also of significance for the interests of specific sectors and occupational groups. Naturally, it is up to readers to draw their own conclusions for local policy and practice.

This publication could not have been produced without the cooperation of many researchers and experts from the Member States, and in particular of those involved in Cedefop's thematic network on trends in the development of occupations and qualifications. Cedefop has derived great benefit from their expertise and their direct or indirect contributions, and we should thus like to express our particular thanks to them here.

We should also like to thank our colleagues in the relevant departments of the European Commission and at Eurostat for their support. Thanks are due to Cedefop's documentation staff, translators, experts and secretariat and the many others who have been involved in the production of this document.

Johan van Rens, Director
Stavros Stavrou, Deputy Director

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Introduction

The European Centre for the Development of Vocational Training, Cedefop, is pleased to present Volume II of the publication on 'Trends in the development of occupations and qualifications in the European Union — Findings of research, studies and analyses for policy and practice'. It contains various articles on current trends, systematically arranged and specially written for this publication by researchers and experts in the field of vocational education and training, and to a certain extent links in with Cedefop's 1998 report on 'Current vocational education and training research in Europe'.

The whole work comprises three volumes:

Volume I contains, in condensed form, important **analyses, findings, conclusions and recommendations** drawn from recent reports by the European Commission and Cedefop, reports by Cedefop's thematic network (Ciretoq) on this subject, selected projects under the Leonardo da Vinci programme and targeted socioeconomic research carried out under the EU's fourth framework programme of research, on topics in the field of analysis, anticipating and predicting trends in the development of occupations and qualifications. It also considers relevant findings taken from reports on research carried out in various Member States. The choice and organisation of the analyses and findings in Volume I is essentially based on the material and statements contained in the articles written by researchers and experts in Volume II.

This volume is aimed at a wide audience, i.e. careers officers, teachers, trainers, students, schoolchildren and parents, practitioners and political or social actors. The wide variety of often conflicting information and knowledge relating to current trends must be thoroughly assessed and, although it will be extremely difficult, efforts have to be made to help the actors concerned, and all those affected by these trends, to make sense of it all and to use it in their own decision-making. It is not a question of presenting the latter with a simple set of rules on what to do, but rather a matter of helping them to make their own assessment of the situation, thereby enabling them to draw their own conclusions in the light of their own institutional environment, and to act accordingly.

Volume I will be published in three official languages of the EU. The original language is German. The electronic version will contain all three volumes in all the language versions and will be published via Cedefop's homepage **www.cedefop.eu.int**.

Volume II will be available in English, French and German and contains **articles written by researchers and experts**, which take a detailed look at the different subtopics under the general topic heading for each trend. These articles are based on the latest original research, findings and interim findings of their authors or groups of authors and research teams. Most of these articles are based on projects carried out in the framework of the Ciretoq network, the Leonardo da Vinci programme or the EU's fourth framework programme of research. Some of the authors have been working for several years in their research institutes on the topics they write about, and have put together the most important findings of their own research.

Volume III contains an annotated bibliography of publications compiled by Cedefop in cooperation with its documentation service. Readers should use this document for looking up further relevant literature on the subject. In addition, a **three-language Glossary** was prepared especially for this publication, which we hope will ease international understanding by explaining any difficult vocabulary or terminology used, for the use of both lay persons and actors in the field. Key words should assist the reader in reaching the relevant chapter in Volumes I and II.

Summary

For this volume, Cedefop launched a call for expressions of interest via the Ciretoq network and other similar research networks in Europe, and asked the authors to write articles on specific topics. The texts were revised by the editor and then approved by the authors. Cedefop then arranged for them to be translated into the other languages (English, French and German), and released for publication.

This volume consists of seven chapters, which are summarised below:

Chapter I deals with the **framework of the systems and its development**, i.e. the education, training and employment systems, particularly their socioeconomic aspects. An important role is played by the international and European dimension and by the inherent challenges facing all systems in the light of social, technological, ecological and motivational changes. This chapter contains four articles which discuss the most important of these aspects mentioned above.

Walter R. Heinz describes trends in occupations and qualifications in recent years from the sociological and historical viewpoint and points to the **great need for changes in education and training**. He traces developments from the highly industrialised society of 'Taylorism' and 'Fordism', that was based on strict divisions of labour, to the challenges of the emerging 'industrialised service-based society' and the coming information, communication and knowledge society. He presents the resulting new job and skill profiles, and those still to be classified and transferred through training, and underlines the need for changes in attitudes and behaviour among institutions and the individuals concerned.

Europeanisation and internationalisation were challenging the traditional models of skills transfer. The renewal or redistribution of the provision of education, training and further training among the various target groups, education levels and age groups was imperative. Not least, the nature of education and training and the methods and provision of training needed to be radically changed. Despite the increasingly rapid changes in job requirements, vocational skills were still, however, key points of reference for individual career and employment patterns and for companies' personnel and employment policies. Trends in skills were not only a decisive factor for the competitiveness of societies in the global economy but also for individual competitiveness and equal opportunities.

Tom Leney et al. report on the major findings of their study, commissioned by the European Commission (DG XXII), **to investigate whether vocational education and training systems and provision within the EU Member States have converged or further diverged.** Their study, based on existing literature, covers the period from the mid-1980s to the mid-1990s. Their overall conclusion was that in the face of common pressures, policymakers in all the Member States were following quite similar or comparable general objectives. They explain how these pressures included changes in technology and the organisation of work, and the globalisation of the production and distribution of goods and services. They stress, however, that substantial differences still continue to exist between the institutions and structures, deriving from cultural traditions and national differences relating to developments in knowledge and research, etc. Common developments would continue to come up against such basic differences.

In analysing trends, researchers needed to select certain specific areas and examine them carefully, because education and training systems tended to be complex. Researchers and experts should pursue dialogue on common objectives and principles at European level, rather than – at this stage, at least – aiming at common action and innovation.

Catherine Gay was commissioned by Cedefop to carry out **research on environment-related skill trends,** and to analyse the contribution made by environmental protection in job creation in various EU Member States. The environment had become a component of companies' policies and integrated regional or local strategies (relating to a local community, a conurbation or a region, etc.). Specific environmental protection projects were found to be decisive for both the acquisition of skills and job creation. These projects were promoted by new partnerships between social, cultural and political circles and actors, and pilot actions carried out by them, leading to a wide diversification in the type and scope of employment and, consequently, the required skills or skills used.

From the design stage to the completion of a project, meanwhile, various occupations and job profiles were emerging whose occupants were taking up the initiative. Project leaders could be managers or technical officers, founders of enterprises or politicians. Common profiles became more apparent when a project was under way: project managers, communicators, organisers and administrators led the employees and project experts, and arranged for their further training, related to the project. Training was an important component of the project and was targeted at all the actors involved. Training was less a question of the acquisition of specific technical know-how than of comprehensive skills and specific competences that needed to be added to the individual, and mostly very different, skills of all the actors involved. Whether, as a result, it would be possible to maintain the professional profiles of the specialised workers involved in the long term remained to be seen. The education and training provided by the formal education and training systems in the countries participating in the study had only just started opening up to these new fields, some of which were highly employment-intensive.

Mario Gatti and ***Claudio Tagliaferro*** report on the findings of their research on the **engineering industry in two regions, Modena and Vienna**, commissioned by Cedefop, and carried out in cooperation with the two regions. Scrutiny of the trends in both regions in this sector had revealed a number of important developments in respect of the needs for certain professions and levels of skills, which in the region of Modena had been immediately taken on board in considerations on how to reform the training on offer and the curricula for vocational training plans, and in Vienna had caused such considerations to get under way. This study illustrates how actors in the field can be directly supported through research, which can provide important fundamental principles and assistance that is decisive in the regional planning of needs anticipation/analysis. Vocational training establishments, technical colleges and universities could make use of such research to continue or change the education and training they provide, quickly and efficiently adapting it to the trends in work organisation. On top of the questions relating to the amount and scope of education and training provided, important conclusions could be drawn relating to trends in completely new job and skill profiles, or new insights on existing profiles could be provided.

Chapter II deals with issues relating to the **development of the supply of and demand for qualifications and skills, particularly with regard to initial education and training.** This chapter contains five articles. Its central theme is whether, and to what extent, skills and training can give people better or worse prospects of getting a job, which levels of education are preferable and which levels of training provide the best opportunities, and in which fields they are likely to be of use.

It examines the impact of modern information and communications technologies (ICTs) on these questions, and the changes in the occupational and work requirements they bring about through the reorganisation of work and new divisions of labour. Was there a risk that specific groups of people or levels of education would be driven out of the workforce by people with higher skills, and did this point to a trend in the polarisation of skills, with highly-skilled workers at one end of the scale and low-skilled workers at the other? The chapter finally examines ways of restructuring training certificates, degrees and diplomas: which institutional instruments could be used and what time span could be envisaged for these qualifications to be adapted to the new requirements and conditions?

Hilary Steedman reports on the findings of a research project commissioned by the European Commission's Directorate-General on

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Science, Research and Development (DG XII) **on low-skilled workers**. This research was carried out in a number of Member States and deals with various aspects: the rising wage differentials between the low-skilled and the higher-skilled, a comparison of their job prospects and trends in participation in, and access to, education and training. In all the countries participating in the project, there had been a rapid deterioration in job prospects for the low-skilled in recent years, while the provision of training and further training had not been developed to meet the need for higher-skilled workers. Technological change was the main cause of this fall in demand for low-skilled labour, and the expanding sectors were those where employees typically had higher level skills.

The next question, namely how can we reduce the number of people in low-skilled employment, was answered as follows: steps had to be taken to increase substantially the number of people continuing their education once they had completed compulsory schooling, i.e. those staying on at secondary school, attending vocational and technical colleges or going on to universities. Short-term measures aimed at early school-leavers, such as work-related youth training and employment schemes seemed, however, to have little effect. These schemes did not necessarily motivate young people to undertake recognised further education or training courses, but tied them down to relatively low-skilled jobs, which might not even lead to stable employment. The excessively high proportion of youth unemployment in most of the countries could scarcely be resolved through such measures. In addition, it also became apparent as the project got under way that fewer workers with lower levels of initial education took part in work-related training or further training. This was not because of a lack of training places in training centres and companies, but because most of these young people seemed to have no interest (or no further interest) in taking part in long-term training courses.

Lex Borghans and Andries de Grip have examined the polarisation of skills, i.e. **the relationship between the higher-skilled and the low-skilled**, from predominantly macroeconomic perspectives, and on the basis of relevant statistics. The bumping-down of the low-skilled by the higher-skilled and the oversupply of higher educated workers is discussed. Were the latter occupying jobs commensurate with their training? And, if, so, how did this affect the job opportunities of the low-skilled? Among other subjects, job competition is compared with wage competition among the low-skilled and higher-skilled. Attempts are made to answer the question of whether or not additional investments in schooling are 'worthwhile'. In obvious cases of bumping down, additional investments in education were not very effective, but, if new fields of activity opened up, the increased productivity of the more highly educated might make more educational investments fruitful. The authors' research suggests that the effects of training might also lead to new employment opportunities, indeed that a good supply of highly-skilled workers might even be a prerequisite for such opportunities.

Moreover, the research revealed that higher skills only paid off under certain conditions for, if higher-skilled workers only took over the jobs of low-skilled workers, their wages would fall. Only where changes in work organisation went hand in hand with the development of new and better products and services, including new fields of activity, could higher skilled workers expect to receive higher wages. However, regardless of whether the replacement process involved a retrograde move (bumping down) or calls for generally higher skills (upgrading), the low-skilled worker was the loser in each and every case.

Lázaro González, presents the findings of a study commissioned by Cedefop, carried out in three Member States, on **the impact of new information and communications technologies (ICTs) on the development of vocational skills and training needs**, concluding with the new challenges facing education and training. These would radically change the job and career patterns of individuals, and methods of work organisation within companies. Enterprise culture had to be changed, as well as the form and content of education and training. Transversal and multi-skilled work teams would be set up in the place of hierarchical or subject-oriented structures. Individual and personal skills, together with social skills, would be vital for work in the information society: creativity and initiative, continuing training, the ability to be aware of the consequences of one's actions, the ability to work in a team, etc. would become more important in the future. The new technologies of the information society of the future would, moreover, require general basic skills that should already have been learnt during initial education.

Werner Dostal also stresses the need to increase the provision of education and training in his article on the subject of computer technology itself. He found a high demand for **computer-related and multi-media skills**, which training schemes and training capacities could scarcely meet.

Employment structures for occupations in the field of information technology and communications technology revealed different types of computer occupation, e.g. core activity, mixed-skills activity and marginal activity. Core activity, or 'pure' information technology occupations were in high demand, but there was also a large number of people working in this area who had come in through the back door, so to speak, and who, because they had been working in a related area, had taught themselves the job and acquired additional skills. Whether these relatively low-skilled workers would be able to continue working in the narrower sphere of information technology in the future, or whether, as the author suspected, they would be pushed back into a more general or marginal area, remained to be seen. That would depend, among other things, upon whether it would be possible to plan and regularise this area of activity, or whether activities that were rather abstract and difficult to regulate would remain to the fore in the future.

In any case, the present and foreseeable future labour market prospects for these occupations was very favourable. On the subject of training, the author calls for the expansion of further and higher vocational education, saying that on-the-job training, such as that provided under the dual system, is inadequate in the medium term. The increasing use of multimedia technology and the Internet, etc. had, moreover, led to the creation of new, more flexible forms of working, such as teleworking, which might replace the traditional structures and patterns of industry. A core team would still remain, but only to a limited extent.

Martine Möbus and ***Eric Verdier*** report on a **comparative study on the structuring and regulation of occupational profiles** and rules, and certification **in France and Germany**. They examined in particular the institutional environment and the coordination measures being taken, and the impact they had on new rules and regulations on vocational qualifications in the two countries. The ongoing processes and their results would not only shape the supply of education, but would, moreover, influence the structuring of the labour market and the industrial relations of both countries in general. The main question behind this study was whether, and to what extent, the processes being used were adjusting to the social and economic challenges, and whether they were in a position to stand up to the rapid changes they brought in their wake.

Could formally defined and officially sanctioned vocational qualifications and skills still provide points of reference in these times of rapid change in labour and production? What impact did they have on trends at sectoral and interprofessional level, and at corporate level? What were these regulations like, were they general regulations, or did they lay down detailed rules? Were they mainly market-oriented regulations such as those prevailing in the Anglo-Saxon countries, or regulations laid down by the supreme authority of the public authorities, as in France, and were the social partners actively involved in the process, as in Germany? The cultural and traditional differences clearly stood out, enabling conclusions to be drawn for the future development of institutional coordination systems in each of the countries concerned. In any case, it was felt that the involvement of the social partners would play a key role in these matters.

Chapter III deals with comparative research, as Chapter II, but under the heading **further education and training and lifelong teaching and learning**. Many of the arguments set out in Chapter II can be carried over and applied to the further education of adults and early school-leavers but, in addition, there is a whole new range of challenges in view of the changing needs for competencies and skills among individuals, companies and the economy as a whole. The two articles together cover the most important categories. While the first article discusses general education and training needs, the new forms of education and training on offer and the educational structures that need to be developed, the second article looks at the education and training needs themselves and how they are the result of new corporate developments and trends in work organisation. The flexibility and adaptability of workers, and their active integration in the new organisation of work and production is emphasised, as a result of which the workforce faced certain challenges as regards education and training, whether employed or unemployed.

Graham Attwell and Alan Brown have examined the **competence and skills needed for lifelong learning** and the trends and challenges across Europe. Qualifications for lifelong learning had become a 'conditio sine qua non' and were regarded as core skills of individuals in order to enable them to have a better chance to develop and maintain their career. This had led to an increasing focus on vocational education and training, particularly at the interface between school and work. Permanent employment as an experienced skilled worker in one occupation would in future be more the exception than the rule. Occupational mobility and flexibility would rather become more necessary for individuals and organisations in the face of increasing competition and productivity.

It was not merely a question, however, of workers being able to adapt to new tasks and fields of activity, but rather of them being able to handle the rate of change, organise their lives accordingly and play an active role in the change processes. The need for continuing lifelong learning was not just the concern of a handful of university and college graduates and professionals. Rather, every man and woman had to be prepared to undertake continuing learning and to be open to new conditions, be they economic, cultural, social or political. This challenged the very taxonomies of knowledge and meaning, skills and experience of European society, dating from the time of the Renaissance, which now had to seek a new identity. What were the new paradigms of learning, the 'what' of learning and also the 'how' and 'why' as the late industrial society drew to a close and a 'cognitive' or 'knowledge-based society' dawned?

Hartmut Seifert presents an overview of the various areas of continuing vocational training, basing his article on **the links between further training within companies, outside companies and industry-wide** in the light of the fact that it was becoming increasingly important for every man and woman to undertake continuing training and learning their whole lives long. Was the training provided by institutions and under the statutory and collectively agreed regulations enough, and did the resulting structure of training supply suffice? He gives examples of the situation in Germany, and comes to rather negative conclusions, stressing the need for adaptability, both in current work organisation and labour market policy and in continuing vocational training and adult education. A closer relationship between work and learning was crucial, whether in companies, further training centres or technical colleges and universities, and could be provided on the basis of new work organisation models and collectively agreed regulations. These regulations would have to place greater emphasis on the above needs.

The existing options had not allowed for the interests of companies, individual workers and persons participating in continuous training to be taken into equal account. Neither the unemployed nor employed, particularly the low-skilled, were being given further training at the right time and they could therefore not apply for the jobs most suitable to them. Any reform of the continuing education and training systems had to provide for a mutually agreed distribution of tasks between companies and public authorities and be based upon the general continuing vocational training needs of the employed, job seekers and the unemployed. In addition to the need for collectively agreed regulations, there was also a pressing need for relevant continuous education and training legislation.

Chapter IV deals with the main points of **training and further training within companies**, particularly the methods used and the competencies and skills they seek to develop. It contains three articles. The first deals with new trends within major European companies and attempts to classify the specific learning approaches created or designed to develop skill profiles. It describes the further training strategies implemented by companies to cope with the ongoing reorganisation of production and services, and illustrates how they are making better use of the potential skills of their employees and involving them more in the change process relating to work organisation. The second article deals with the competitiveness of small and medium-sized enterprises and their approaches towards providing technology and management training for their workforce. SMEs had to improve their chances of survival, particularly through the further training of managers and the entrepreneurs themselves. In view of the great pressures placed upon the latter, new paths would have to be taken and a system of comprehensive support, information, advice and continuous training set up between companies. The third article deals with similar issues relating to practical approaches and experiences. It shows that by establishing closer links between measures implemented by the public bodies of a sector or region and local companies a strengthening dynamic could be set in action that encouraged job creation, and promoted the competitiveness of the companies and region or sector concerned. Training and further training provided by VET colleges, technical colleges and universities in the region, training schemes set up in cooperation with companies and the adaptability to meet on-the-spot needs would play a crucial role in this process.

***Barry Nyhan*'s** article describes trends in competence development, which was **one of the strategic factors in ensuring companies' survival and competitiveness**. There was still much discussion going on concerning the nature of the competencies required, and how companies could become learning organisations and create an organisational learning climate which would support the development of these competencies, and there was no agreement on the matter. Using case studies, the author puts forward a taxonomy of methods and competencies for the very different teaching and learning situations, discusses the conditions and calls for efforts to be made by companies and industry-wide to improve the interaction between informal (on-the-job) teaching and learning and formal (classroom) teaching and learning. Companies with more vision in this matter had already started taking steps in this direction and were making great efforts, but many others had got no further than general considerations of the matter.

A number of general principles firstly had to be clarified, which were needed to underpin the ongoing change and adaptation process and its dynamic, namely visionary management and support given by managers of enterprises, their willingness to take risks, trust in the competencies of their workforce and wide understanding of the change process itself, etc. The competence profiles required were emerging along the following four axes – cognitive, technological, social (organisational) and business (entrepreneurial). Efforts had to be made to understand and master the general complexity of the situation behind each profile. This was no longer a management concern alone, but one which demanded the full participation of all the workers and experts in a company.

John Konrad underlines that **the most crucial problem facing small and medium-sized enterprises and new enterprises was how to strengthen their chances of survival**. A large number of new enterprises would not survive the difficult start-up period. Access to effective training that met their short- and long-term needs had to be improved. This could increase employment and promote social integration, and also encourage a flexible, decentralised and adaptable economy. The author calls upon researchers to double their efforts to determine the necessary support mechanisms that can be implemented at local and regional level, appeals for the recognition of training qualifications across Europe, and asks for greater commitment on the part of the EU in promoting local structures and actions, particularly in view of the Agenda 2000 programme for the accession of eastern European countries to the EU. New concepts, actions and practices needed to be developed and fostered through greater cooperation in the field of research.

Loek Nieuwenhuis's article concentrates on the **role of vocational education and training in facilitating innovation in small and medium-sized enterprises** in the process of regional and sectoral development. Local industrial networks and their links with VET colleges and training centres in the region were becoming increasingly important for sustaining the dynamic of the training process. Common learning activities and continuous interaction between VET colleges and companies would take the place of traditional initial vocational training and further training, despite the fact that the role of VET colleges in these innovation processes was still rather marginal. To become 'spiders' in regional innovation networks, VET colleges had to develop towards becoming learning and networking organisations themselves. Using a number of concrete examples in the Netherlands, the author clearly shows how such networking and dynamics can make significant contributions to both local and regional economic development and to the renewal of sectors of the economy as a whole.

Chapter V deals with the **teaching and learning of language skills**, that are becoming increasingly important in view of European integration and the spread of internationalisation. It contains one article which underlines the prime importance of learning language skills for vocational education and training, as well as adult education. The contribution deals with the study of languages within vocational education and training and the use of new technology in teaching foreign languages and in the learning process.

Gruber (et al.) set out the findings of Leonardo da Vinci projects in the field of **'Vocationally oriented language learning (VOLL)'**. Language training needs had to be assessed from the point of view of working situations in which languages were really needed. Language learning was of dual significance for working life because it constituted a major element in a person's general cultural development and was an advantage when it came to obtaining a job, either inside one's home country or when taking up the option of mobility available within the Union. The use of modern multimedia training could considerably assist language learning processes. Computer tools would, however, be used in conjunction with other training methods and schemes that would provide contact with the teachers and persons of the mother tongue. Mere training in structural (grammatical) and vocabulary knowledge would not result in real linguistic competence and language proficiency. Concepts on how to use these new forms of training were being developed, together with information on how the new information and communication technologies (ICTs) could be used in language training. These in particular should be of great interest to students learning new languages for use in their job, as well as their teachers.

Chapter VI gives a summary of **the approaches used in and the findings of various EU programmes and activities concerning vocational education and training**: it surveys and analyses projects of the Leonardo da Vinci (LdV) programme of the European Union, the EU's fourth framework programme of research and the work carried out by Cedefop and its network, Ciretoq. Projects launched in 1995 and 1996 in the framework of the Leonardo da Vinci (LdV) programme on the anticipation of qualifications and competences are analysed in detail, and tentative conclusions are drawn up. The remaining articles deal with the opportunities and prospects for 'European' vocational training research, together with its limitations, and – in terms of the more specific support provided by policies – with the tools and methodology of scenarios aimed at facilitating comparative research within the EU.

Marc Ant and Jeff Kintzele have written a comprehensive article for this publication, entitled **'Surveys and analyses: projects of the Leonardo da Vinci programme'**. As well as describing the main points, topics, subjects and approaches of the research activities currently being undertaken, it looks at the topic of 'anticipation of qualifications and competences'. The great diversity of topics and approaches discussed, and the methods used, give some idea of the wide variety of findings achieved, or likely to be achieved in the next few years. These findings are mostly highly specific in nature and, as a rule, can be applied only within a certain context and for relatively limited innovations. The effects of these find-

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ings and ways of putting them into practice through the implementation of pilot projects in the Member States are also examined.

Burkart Sellin, in a second article on the **anticipation of competencies and qualifications**, summarises the preliminary findings of projects carried out under the Leonardo da Vinci Programme, on the anticipation, forecasting or projection of trends and developments concerning qualifications/competencies and employment/occupations, and endeavours to make an initial assessment and to draw some tentative conclusions. This study was carried out by Cedefop in cooperation with the firm of consultants BBJ (Berlin/Brussels) in the spring of 1998. The projects carried out under the first call for tenders of 1995 had already been concluded, but only a few of those carried out under the second call for tenders of 1996 had achieved any results; a large number of projects were still under way, so this analysis could be considered only as an interim report.

One thing stood out during the course of the study, however, namely the lack of coordination between projects on the same subject; it would have been extremely useful to have had a continuous exchange of information and experience, and closer cooperation between projects, as this would have achieved synergy effects, and thus maximised the benefits of the findings for all the actors, Member States, practitioners and politicians involved. An ex post analysis of project clusters would only be worthwhile, in his opinion, if projects were linked by cooperation networks, or at least participated in information exchange programmes.

Michael Kuhn and Erhard Schulte are both closely involved with European projects on research into education and training, including vocational training, on behalf of the Directorate-General for Science, Research and Development of the European Commission. They present an initial overview of experiences with cross-border projects, particularly in the field of vocational education and training research, and put forward proposals on how the **'European dimension' and culture of education and training research, including vocational training,** could be strengthened. For Europe, it was necessary, wherever possible, to introduce a more holistic vocational education and training research concept, and a common research agenda; a new balance between national and regional culture and European identity had to be established. Europe had to abandon comparative research in favour of 'collaborative' research. Cooperation and coordination had to be intensified at all levels. If possible, vocational education and training research should be accepted as a separate research discipline and its interdisciplinary nature particularly emphasised. The authors, inspired by Cedefop's creation of the thematic network (Ciretoq), stress the urgent need to set up thematic cluster groups and institutes within the European Union, and to establish cooperation programmes among them. Transnational and European research, in tandem with cooperation in the field of vocational education and training, could lead to the development of a real 'European society' in the medium term.

Fons van Wieringen presents the **scenario methodology** as a means of analysing trends and strategies in the field of vocational education, particularly in the increasingly important area of adult education. This methodology had already been used in the past, particularly in the field of sociology, and was now being viewed with increasing interest as a useful tool in the fields of economic policy, labour market policy and vocational education policy, for the purposes of international comparison and trends. To avoid one-sided speculation on what might occur in the future, the author interviewed the experts or stakeholders who were actually participating in the new developments themselves. The questions were grouped according to major trends, which were also divided into subgroups of other trends representing basic conditions for vocational education policy, some of which came as no surprise. The various elements of the scenarios could then be arranged in different ways, depending on the expected (i.e. particularly policy-oriented) basic conditions within a given context. For the purposes of comparison within Europe, this methodology appeared to be particularly suitable as a means of offering alternatives to policy decision-makers and social actors. Cedefop is currently carrying out a research project using this methodology and is hoping to come up with appropriate results by 2000.

Finally, **Chapter VII** refers to work currently being carried out by **Cedefop's thematic network, Ciretoq**, that has not already been mentioned in the articles in this volume. The network's objectives, working methods and work topics are described for readers who know little, or nothing at all, about it. In addition, there is a short interim report on work currently being undertaken by the network and findings, together with a list of publications. Then, last but not least, is a summary of the findings of some of the projects being carried out, on various topics. Information concerning member institutes and reports published by the network is available on Cedefop's home page: **www.cedefop.eu.int.**, which is updated on a regular basis: The 'Ciretoq-Newsletter', published twice-yearly, is available (only from Cedefop), free of charge. It is also available electronically, via Cedefop's home page.

I. The socioeconomic context and systems' development

Chapter I deals with the **framework of the systems and its development**, i.e. the education, training and employment systems, particularly their socioeconomic aspects. An important role is played by the international and European dimension and by the inherent challenges facing all systems in the light of social, technological, ecological and motivational changes. This chapter contains four articles which discuss the most important of these aspects mentioned above.

Walter R. Heinz describes trends in occupations and qualifications in recent years from the sociological and historical viewpoint and points to the **great need for changes in education and training**. He traces developments from the highly industrialised society of 'Taylorism' and 'Fordism', that was based on strict divisions of labour, to the challenges of the emerging 'industrialised service-based society' and the coming information, communication and knowledge society. He presents the resulting new job and skill profiles, and those still to be classified and transferred through training, and underlines the need for changes in attitudes and behaviour among institutions and the individuals concerned.

Europeanisation and internationalisation were challenging the traditional models of skills transfer. The renewal or redistribution of the provision of education, training and further training among the various target groups, education levels and age groups was imperative. Not least, the nature of education and training and the methods and provision of training needed to be radically changed. Despite the increasingly rapid changes in job requirements, vocational skills were still, however, key points of reference for individual career and employment patterns and for companies' personnel and employment policies. Trends in skills were not only a decisive factor for the competitiveness of societies in the global economy but also for individual competitiveness and equal opportunities.

Tom Leney et al. report on the major findings of their study, commissioned by the European Commission (DG XXII), **to investigate whether vocational education and training systems and provision within the EU Member States have converged or further diverged.** Their study, based on existing literature, covers the period from the mid-1980s to the mid-1990s. Their overall conclusion was that in the face of common pressures, policymakers in all the Member States were following quite similar or comparable general objectives. They explain how these pressures included changes in technology and the organisation of work, and the globalisation of the production and distribution of goods and services. They stress, however, that substantial differences still continue to exist between the institutions and structures, deriving from cultural traditions and national differences relating to developments in knowledge and research, etc. Common developments would continue to come up against such basic differences.

In analysing trends, researchers needed to select certain specific areas and examine them carefully, because education and training systems tended to be complex. Researchers and experts should pursue dialogue on common objectives and principles at European level, rather than – at this stage, at least – aiming at common action and innovation.

Catherine Gay was commissioned by Cedefop to carry out **research on environment-related skill trends,** and to analyse the contribution made by environmental protection in job creation in various EU Member States. The environment had become a component of companies' policies and integrated regional or local strategies (relating to a local community, a conurbation or a region, etc.). Specific environmental protection projects were found to be decisive for both the acquisition of skills and job creation. These projects were promoted by new partnerships between social, cultural and political circles and actors, and pilot actions carried out by them, leading to a wide diversification in the type and scope of employment and, consequently, the required skills or skills used.

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From the design stage to the completion of a project, meanwhile, various occupations and job profiles were emerging whose occupants were taking up the initiative. Project leaders could be managers or technical officers, founders of enterprises or politicians. Common profiles became more apparent when a project was under way: project managers, communicators, organisers and administrators led the employees and project experts, and arranged for their further training, related to the project. Training was an important component of the project and was targeted at all the actors involved. Training was less a question of the acquisition of specific technical know-how than of comprehensive skills and specific competences that needed to be added to the individual, and mostly very different, skills of all the actors involved. Whether, as a result, it would be possible to maintain the professional profiles of the specialised workers involved in the long term remained to be seen. The education and training provided by the formal education and training systems in the countries participating in the study had only just started opening up to these new fields, some of which were highly employment-intensive.

Mario Gatti and Claudio Tagliaferro report on the findings of their research on the **engineering industry in two regions, Modena and Vienna**, commissioned by Cedefop, and carried out in cooperation with the two regions. Scrutiny of the trends in both regions in this sector had revealed a number of important developments in respect of the needs for certain professions and levels of skills, which in the region of Modena had been immediately taken on board in considerations on how to reform the training on offer and the curricula for vocational training plans, and in Vienna had caused such considerations to get under way. This study illustrates how actors in the field can be directly supported through research, which can provide important fundamental principles and assistance that is decisive in the regional planning of needs anticipation/analysis. Vocational training establishments, technical colleges and universities could make use of such research to continue or change the education and training they provide, quickly and efficiently adapting it to the trends in work organisation. On top of the questions relating to the amount and scope of education and training provided, important conclusions could be drawn relating to trends in completely new job and skill profiles, or new insights on existing profiles could be provided.

A. Vocational socialisation and competence development: the historical dimension

Walter R. Heinz (¹)

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Summary and outlook

This paper shows how vocational skills are rooted in social, political and economic conditions. This is explained from the viewpoint of vocational socialisation: training, the working process and career patterns connect the individual with society. Vocational socialisation and the activity of work provide a field of experience and social links for the purposes of building up an identity on the one hand and, on the other, they set boundaries to autonomous organisation of one's life. It is argued that in industrialised service-based societies, skills (including general, technical and vocational characteristics) play an important part in the way one lives one's life and in biography, as well as in the way the economy functions. This is documented with reference to the trend for more skills to be required as industrialisation processes advance from Taylorism via Fordism to the information, communication and know-how society.

With the change in emphasis in employment from industrial manufacturing to service-based activities, key skills, in particular cognitive and social/communicative skills, are becoming ever more important. This trend is examined on the basis of the discussion of 'soft skills' and their importance to individual career profiles and to the competitiveness and flexibility of individual companies and of the economy as a whole. The link between training, work experience of work and further training in a country on the one hand and economic development on the other is conveyed via the breadth and depth of the skills profiles conveyed, i.e. the 'polyvalency' of the skills and know-how of its workforce (cf. Maurice, Sellier, Silvestre 1986). This is increasingly a question of combining specialist and social skills, which are required if people are to be able to move from old to new technologies and from old to new forms of paid employment, where different kinds of work are expected from them.

In Germany, until the 1980s, the dual system of vocational training, combined with a relatively flat hierarchy in large industrial companies and accompanied by cooperation between the social partners, continued to prove its worth in two respects: it kept youth unemployment low and provided specialist and social skills for most of the young people who did not have or did not seek access to continuing specialist training or a university education. The dual system was also the basis for a broad social consensus, the best possible vocational training for the population being regarded as the best basis for withstanding international competition. In the 1990s, however, the reduction in the number of training places available, especially in large companies, the lack of apprenticeships in companies in the new *Länder*

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and the related changes in the attitudes of young people and parents to the choice of occupation and study suggest a crisis in the dual system.

The system of vocational skills acquisition operated by the social partners develops skills profiles in the context of the cultural model of the 'occupation/vocation' (cf. Heinz et al. 1998) via a learning process in the company accompanied by academic training – i.e. in a socialisation phase lasting around three years and comprising work experience, specialist theory and general education. This differs from the process of skills training via brief on-the-job training with no certification, as is customary in the UK, and from the school-based vocational training in France. Meanwhile, John Bynner (1998) has established that in the UK, occupation-specific work skills are becoming less important as recruitment criteria than basic knowledge (general education and computer skills) and psychosocial skills, such as manners, staying power and flexibility.

This shift in the skills required from specialist vocational to social and personal skills is characteristic of societies with strategies attaching less importance to skills and based on short-term adjustment to the market. In the USA, for example, until the early 1990s only around 50 % of jobs specifically required specialist skills (cf. Ashton and Green 1996). Even if in Germany and most continental European societies the actual work done by employees does not necessarily reflect their skills or those of job applicants as regards form and content, their vocational skills are still, however, key points of reference for individual career and employment patterns and for companies' personnel and employment policies. Thus trends in skills profiles, in the nature and level of employees' competence and skills, are largely dependent on the educational traditions and the political and economic strategies in the country concerned and on the balance of power prevailing in society. The fostering of high-level or low-level skills is accordingly not simply a decision for the individual company or individual person, but is embedded in the education and training systems developed by a country or a region in the course of industrialisation, and which it is attempting to preserve or adapt in this age of global economic competition. Europeanisation and internationalisation and the progressive expansion, improvement and reduction in the costs of information and communications technology, together with the simultaneous changes in attitudes and behaviour, present a challenge to traditional models of skills transfer, and are making completely new demands on the education and training of young people and adults.

1. Socialisation for and through paid employment

In the industrialised service-based society, the way people's lives develop and the circumstances in which they live are structured by the labour market and the level of individuals' skills. At the same time, the prevailing cultural models and the structure of opportunities in the world of work mean that the individual's interests and plans are geared to the society in which he or she lives. On the one hand, participation in the work process limits the scope available for autonomous planning of one's life, but on the other hand it ensures not only one's existence in material terms, but also identification with the tasks set, job content, colleagues and the context of corporate life (cf. Jahoda 1983).

From this perspective, vocational skills acquired and changed in the course of socialisation processes acquire particular importance with regard to shaping the lives of individuals and the way in which the economic system functions. Vocational socialisation covers both the phases of preparing for the world of work (family, school and vocational training) and the learning processes involved in paid employment. Vocational learning and development processes not only include the specialist and social skills required for the activity in question, but are also a key point of reference for the individual's identity (Heinz 1995). These points of reference are becoming all the more important as religion, nation, and even family and social class become less important as frameworks with which individuals can identify.

Analysis of trends in skills from the perspective of socialisation theory differs from the approach of the training economy, which is based on human capital (Kerr et al. 1962); the latter stresses the value to employment of individual investment in education and training, as an explanation for processes of skills acquisition. This model ignores the fact that the conditions and results of education (and training) are dependent on the institutional structure of a society's education systems and on the corporate and State labour market policy which obtains (cf. Blossfeld 1989; Ashton and Green 1996). In contrast, the socialisation model takes account of the content and organisational aspects of vocational training, in other words the social process of the production of skills, as well as the structures that may restrict equal opportunities in the skills-acquisition and work processes.

This reveals that vocational skills and know-how are embedded in social, economic and political conditions. Thus although, for example, special training programmes for socially disadvantaged young people in Germany are based on the rules of the dual system, they tend to prepare them for semi-skilled activities (girls for domestic occupations, boys for manual trades/technical activities), since they are oriented primarily towards traditional (dead-end) occupations and operate in institutions outside companies. In the 1980s, attempts were made in the UK to reduce youth unemployment using Youth Training Schemes (YTS), but without providing young people with a recognised vocational qualification offering chances of long-term employment. These examples show that the acquisition of vocational skills is a process which differs according to the social structure; the five fundamental dimensions of that process are dependence on the labour market, vocational orientation, integration into a company, social origins and sex.

In their classic essay on careers and vocational socialisation, the social psychologists Becker and Strauss (1972, p. 370) found that the reference framework for the analysis of careers is at the same time a reference framework for the analysis of identities, since the life of adults is characterised by the fact that it both facilitates and forces upon people frequent and radical changes in status. By careers, they mean vocational careers, i.e. series of working activities recognised and standardised by society, which are related to one another and differ in terms of prestige and income. Careers are something that working people move through in predictable fashion, which enables them to develop their life plan in stages.

Applied to the debate on vocational socialisation, this means that State-regulated vocational training and university education provides a very specific basis for occupational biographies which take the form of careers. In Germany, for example, this applies to both the skilled trades (from apprentice to journeyman and master craftsman) and to industry (from trainee to skilled worker, to foreman, to skilled worker with special qualifications) and serves as a model for government service, in which white collar workers and government employees have careers with appropriate salaries and job gradings. In the expanding service sector, however, it is becoming ever less common for career paths to follow career patterns of this kind; they tend to be much more subject to labour market requirements for flexibility and to rationalisation trends in the production and service sectors.

In the end, the question of the extent to which training content and the various features of the activities we perform in the course of our working life shape our social identity and the way we live our lives as a whole is an empirical one. Careers theory assumes that it is above all professionalised occupations and their professional organisations, together with their standards of ethical conduct, that shape social position and identity and give meaning to biography. However, this viewpoint places too much emphasis on the *liberal professions*, namely medicine, law and other professions usually involving academic training, such as teaching. Skilled tradesmen, sales people, technicians and nurses also have specialised and social skills and represent vocationally oriented values which they develop through their training and in the course of their jobs, even if they do not follow a specific career.

Socialisation for, and through, work and occupational culture is closely bound up with the identity of the individual. *Identity* is a concept from the theory of interaction in social psychology, relating on the one hand to the individual's capacity to behave consistently in the face of changing demands and life situations that are often difficult to reconcile; on the other hand, it also relates to life goals and plans for the shape a person's life will assume, in the sense of the individual's ideas as regards personal development. The first dimension relates to the social side of identity, and the second to the personal side. Identity is a model of interpretation of oneself and one's environment that is relatively open to experience but not infinitely flexible, which can change in the course of one's life, especially in present-day societies.

In structures shaped by work, such as the German employment and welfare system, identity may relate to a relationship to work and the part it plays in the biography of the individual which is subjectively seen as giving meaning to life. This distinguishes German society from the job-oriented market systems of the UK and North America (cf. Banks et al. 1992; Ashton and Green 1996; Jobert et al. 1997). As Martin Baethge et al. (1988) showed, for example, in young adults, concepts of life based on work are the empirical expression of the social and personal sides of identity. The occupational psychologist Ernst-H. Hoff (1990) formulates this connection in a similar way when he says that a life structured in terms of work allows people to believe they are engaging in long-term thinking, and this has a reciprocal relationship with social skills such as planning ability, initiative and personal development. People can, however, make an individual mark on their work only if they have scope for involvement in shaping that work and opportunities for career development. For those without vocational qualifications, separate, often unpredictable discontinuities arise throughout their lives. According to Hoff (1990, p. 11), their lives are unlikely to be regarded as decided by themselves and susceptible to planning, but must appear to be decided by others and impossible to plan, there being little possibility of influencing them; they may even appear to be a matter of chance. If there are frequent breaks in working life, either because of changes in job, company or occupation, or owing to unemployment, then the development of career plans and of a job-based identity is put at risk. Consequently, discontinuous working patterns are linked to socialisation processes in which social identity comes to be based on things other than the occupation. In many cases, people's perception of themselves in relation to work, and their values, are transferred to biographical projects, such as the idea of achieving a change of occupation (perhaps via intensive efforts involving further training) or becoming self-employed (cf. Ulich et al. 1985; Welzer 1990; König 1993).

Research into vocational socialisation has produced numerous empirical findings showing that the job requirements and career options in an occupation, combined with the corresponding processes of acquiring skills, are of key importance to social identity (cf. e.g. Brose 1986; Baethge et al. 1988; Mönnich and Witzel 1994). It is not difficult to conclude from this that the concept of self and occupational values vary from one job or career pattern to another, since in an industrialised society different occupations present different opportunities for integration and development. By means of individual planned decisions, but more often by seizing opportunities, people in work succeed to varying degrees, depending on companies' recruitment processes and further-training strategies, in linking the requirements of the relevant labour market segment and of jobs both to their skills and knowledge and to their own wishes and interests.

This process of coordination is determined neither by the employment system nor by employees, but is the result of processes of vocational socialisation. Training, the employment situation and career patterns play a part in the fact that vocational skills profiles and the way they change in the course of the individual's life accentuate and alter particular patterns of identity. The best way to make these processes clear is by adopting an approach based on the theory of interaction and biography, an approach that assumes that people actively shape the circumstances of their lives in such a way as to make them compatible with their identities and their biographical projects.

With the current trend for jobs and occupations to (have to) be changed like suits off the peg, those in employment are faced with the problem of frequently having to develop a new mental and social/emotional orientation in respect of employment situations, career options and employment risks. The vocational identity already developed has to be transformed, old building bricks have to be replaced by new experiences, and skills profiles have to be adjusted or expanded, in order to make it possible to demonstrate the flexibility required by modern work organisation. However, if there is an increase in the dependence of job patterns on labour market segments and corporate strategies of rationalisation and, at the same time, an increase in the individual's demands in respect of job content and scope for freedom of action, social identity will grow weaker as the world of work and the world at large modernise. Admittedly this gives rise to opportunities as well as risks, as is very clear from the expanded perspective on life of younger women in particular, whose life plans are now based not so much on family-oriented models, but on both a career and a family (cf. Hoff 1990).

In the current service-based society and in the information and know-how society that is developing, the gravitational pull of processes of vocational socialisation is shifting from socialisation (in the sense of learning conventional social and vocational roles) to individualisation. What this means for vocational socialisation is that the internalisation of working standards is gradually giving way to the formulation of subjective expectations as regards job content and to the active shaping of career biographies. Although skilled workers, semi-skilled workers, many lower- and medium-level white collar workers and, in particular, civil servants are still primarily geared towards the model of a biography comprising continuous employment in a particular labour market segment, the research of Schumann et al. (1994) and Baethge et al. (1988), for example, provides evidence that new career biographies and new skills profiles are coming into being in the course of an active confrontation with rationalisation of the content and organisational dimensions of employment in companies. Thus a more open and, at the same time, more distanced relationship to the company, a high level of awareness of skills, and a further skills-acquisition strategy geared to competition are becoming characteristic of the occupational biographies of skilled workers in the core workforce of large companies. In this context, expectations of a career pattern that can be individualised are bound up with the technical, theoretical and social skills required in high-tech companies. Vocational or specialist know-how, knowledge which extends beyond the precise requirements of the job, the demand for room for manoeuvre, interesting and meaningful work, and the acquisition of further or higher skills – all these are becoming key elements of the social identity of the modern working man or woman. Even if not all employees have this type of identity, it still indicates that the connection between career patterns and individualised strategies for action in the world of work is becoming increasingly important.

2. The historical development of skills: from work virtues to key skills

In their book *'Soziologie der Arbeit und Berufe'* (Sociology of work and occupations) (1980, p. 70), Beck, Brater and Daheim trace the historical development of the social division of labour as far as the industrialised society, and establish that in the course of industrialisation, despite all the drastic changes in skills required and job structures, the social inequality of occupations and their links with particular social environments and classes have tended to be reinforced and intensified rather than relaxed. They put this continuity down to the fact that the clusters of skills and activities delimiting vocational specialisations have always served to reproduce the social differences between people and between men and women, something they continue to do today.

Since the clustering of activities and skills in the form of occupations is, ultimately dependent on labour market structures and not on individual aptitudes, it is primarily those patterns of activity for which there is a social need that develop into occupations. This is demonstrated, for example, by the reduction in the number of occupations in which formal training is provided in the context of the dual system in Germany, which fell from over 900 in 1950 to some 360 in 1996, and by the emergence of new occupations such as economic engineering, computer science and environmental engineering. The demand for specific skills and knowledge was revealed in the courts of the Middle Ages, as it is in present-day towns and cities, through the fostering of training avenues corresponding to the interests of the nobility, the clergy or the bourgeoisie; this applies, for example, to crafts, commerce and the introduction of banking.

With the social construction of the 'independent waged worker' in the early stages of industrialisation, the division of skills taken over from the era in which the social order was based on privilege, which separated mental and physical activities, craft/industrial, sales/administrative and academic occupations, became deeper. Socialisation for waged work in factories involved more and more elements of peasant and gradually also craft families. This process of proletarianisation led to the dissolution of the characteristic unity of possession, activity, skills, lifestyle, level of cultural standards and value concepts which shapes the entire life of the individual, but in particular his knowledge and abilities, his fundamental attitudes and basic skills, his awareness and his standards (Beck et al. 1980, p. 58).

The great majority of workers from the propertyless social classes were left with the status of 'unskilled workers'. In the 19th century, they were taught the factory regimen involving the work virtues of punctuality, reliability, subordination to the rhythm of machines, sometimes with the aid of drastic programmes of reeducation. While the lifestyle of the peasant classes was geared to the rhythm of the natural world, which balked at the intensive exploitation of their energy in factories, the industrial way of working in capitalist companies, subject to the rhythm of machines, imposed a time economy on workers within the factory regimen, sometimes involving disciplinary measures (cf. Marx 1968).

Craft workers, who were losing ground in the competition with industry, became the first skilled workers in mechanical engineering plants. Since they possessed both craft skills and the necessary work virtues such as punctuality, reliability and precision, and had a specialisation-related identity, in the second half of the 19th century they constituted a fundamental guarantee of industry's competitiveness. Unlike unskilled and semi-skilled workers, they needed to be taught very little in the way of work virtues, but had, rather, to be taught, i.e. encouraged, to abandon their previous independent and integrated way of working.

The rapid growth in industrial production led to a further differentiation between patterns of occupational identity. An increasing need arose for bureaucratically and rationally organised company administration. For activities of this kind, companies were able to call on clerks and book-keepers from commercial offices, formerly independent traders and State employees, who now took up jobs at various management levels, from the office via section management to company management. At first, that is to say, before employment status became linked to the performance principle defined in terms of educational qualifications, this new middle-level social stratum – white-collar workers – was granted privileges deriving from the era in which the social order was based on privilege, as regards the terms of their contracts, payment and working environment (for details, cf. Fischer 1972).

Around the turn of the century, companies were increasingly demanding that skills be standardised through the introduction of training catalogues. This was because work organisation in companies was increasingly distinguished by a division between planning and executive activities under F.W. Taylor's system of scientific company management (1913). Technical and organisational skills were increasingly required, in addition to manual skills, in order to ensure an efficient work process and for its planning and control. At the beginning of the 20th century in Germany, for example, State and industry agreed on a definition of different careers and training avenues which, anchored in vocational schools and State examination regulations, and in combination with company training courses, formed the basis for today's skilled trades (cf. Georg and Kunze 1981).

In the context of this development, it should be remembered that not only specialist training, but also vocational socialisation in respect of the dominant work virtues concerned, has been at the heart of the training practice followed since that time. It is also worth noting that vocational training and university studies were primarily tailored to 'male' occupations: their target groups were male apprentices, or senior civil servants. Only a small number of trades (e.g. hairdresser, gardener) and a larger range of middle-level commercial occupations (saleswoman, office junior, office administrator, etc.) were open to women (until the present time). In the fields of education, social work and health care, where the majority of workers have always been and still are women, training did not and does not form part of the dual system, but takes place in vocational colleges (full or part time) or colleges of education.

Thus in the organised processes of socialisation in the industrial companies of those days, a skills profile was built up that consisted of work virtues which are still of importance today when trainees are taken on. 'The ideal trainee is reliable, eager to serve, honest and industrious, he shows initiative, and is conscientious and purposeful' (Neuberger 1991, p. 90). In fact, in today's companies initiative takes priority over the characteristics of punctuality, orderliness and discipline. Nevertheless, in view of the technical and organisational changes taking place in the economy and within companies, the question arises whether the high value still attached to more traditional work virtues, albeit with the addition of a few modern interlopers like 'initiative', is appropriate to the demands for adaptability and adjustment with which today's employees find themselves confronted in their working lives.

To summarise, with regard to the history of changes in skills profiles, it can be stated that in the first wave of industrialisation, up to the end of the 19th century, there was little demand for particular skills. Alongside former craft workers, companies mainly employed unskilled workers. Textile companies and steelworks expected their workers to be disciplined rather than educated, and encouraged them to perform in a manner appropriate to a time economy, in accordance with Taylor's methods of 'scientific company management'. In the second wave of industrialisation, which involved mechanical engineering, the chemical industry and automotive manufacturing, it was primarily technical and engineering skills that were required of supervisors, while specialist vocational skills, e.g. relating to specific products and materials and to repairs, were required of increasing numbers of workers. This trend characterised the *technology-intensive* phase of Fordism, in which control of the work process shifted to production engineering (assembly lines) (cf. Braverman 1977). In the third wave of industrialisation, which is still in progress and is shaped by computers, the communications industry and financial services, analytical, conceptual and social skills are in demand – thus introducing a *knowledge-intensive* phase in skills development.

Yet even here the new microtechnologies are not exerting a direct influence on skills profiles. Much more influence is exerted by the relevant company organisation, the traditional standards of the education and employment systems and, last but not least, by the scale of State and supranational regulation of the labour market. Thus in the United Kingdom, for example, the collapse of manufacturing industry in the 1980s and the increase in unskilled jobs in the service sector have led to a reduction in training for middle-level qualifications (Ashton and Green 1996). This is likely to have resulted in greater polarisation of the workforce, namely into unskilled, insecure and poorly paid *'job careers'* on the one hand, and higher-skilled, flexible and well-paid *occupational careers* on the other. In contrast, in continental European societies, skills profiles tend to be divided into traditional, craft-based, simple service skills; middle-level administrative, technical and service skills; and higher professional skills.

While in the Taylorist and Fordist production systems, technology was used to replace craft workers and skilled workers by semi-skilled workers, the information and communications industry, shaped by microelectronics, is characterised by a comprehensive transformation of skills. This transformation is taking place against the background of the transition from production concepts based on part processes to integrative, network-based service concepts geared less to products than to customers.

Here, information exchange and knowledge processing take the place of directly production-based and administrative activities (cf. EC 1996). This trend is reflected in the dominance of services, which according to the 1995 microcensus accounted for 82.6 % of paid employment in Germany; this includes personal and production-related services.

The restructuring of work processes via networked organisation and the introduction of interactive software (cf. Braczyk 1996) is leading to the removal of the division of labour into case-handling and clerical operations in the field of administration. As a result, job combinations requiring a higher level of skills are coming into being and are replacing typical office jobs for women by assistance, support and advisory activities requiring a broader skills profile, and involving above all the capacity to render administrative processes cooperative and process-oriented, and to take advantage of the scope for personal initiative.

Dybowski, Pütz and Rauner (1995) studied the effects of organisational development on processes of acquiring vocational skills. In response to the thrust for modernisation in the world of work and as a result of the shift of occupations into the service sector, the skills debate has, since the early 1970s, moved away from the distinction between specialist vocational and socio-normative skills to the subject of *key skills*. This relates not so much to the traditional work virtues as to the use of sound specialist knowledge, technical skills and social skills in a way appropriate to the situation, i.e. flexibly. This above all requires people who ensure their own socialisation for, and through, their occupation (Heinz 1988). However, for companies this is two-edged, since the output of employees can no longer be controlled by reward, instructions and monitoring alone, but increasingly has to be motivated by negotiation and consultation techniques in the sense of participatory or consultative management. With regard to middle-level and senior positions in particular, management consultants and organisational psychologists are agreed that, in selecting staff and in further training, management should concentrate on so-called soft skills, i.e. primarily communicative and social skills.

The forecast made by industrial and employment sociologist Martin Baethge (1991) is in agreement: it suggested that there would be a reduction in the proportion of work determined by others in companies, but that in particular there would be an increase in the demand by employees for work that has a vocational content, is communicative, expressive and active, because of their desire to *actively contribute to and to shape* their own work environment. This means that vocational work could regain its importance for the development of identity and the structuring of biography, but in a way more strongly oriented towards an individualised life structure, and less along the lines of traditional vocational models and worker solidarity. This trend may bring with it a multitude of subjective interests and attitudes to life, as well as major differences in work situations. However, *normative subjectivisation* of work is dependent not only on expansion of the scope for initiative, e.g. via decentralisation of responsibility in companies, but also on the relevant skills, inclinations and concepts of life built up by socialisation in the family, at school and at work.

3. Increase in the importance of cognitive and social skills: fit for work as a result of 'soft skills'?

Since key skills were formulated by Dieter Mertens (1974), they have remained an enigmatic concept, but one that has been largely accepted by the social partners and politicians; the concept has not, however, been adequately clarified in the course of either the vocational training or the sociological or education science debate. Nevertheless, key skills are an important leitmotif of modern vocational training, one that aims to combine psychosocial skills with specialist vocational skills and knowledge. The debate relates to the new relationship to be defined between general education, specific training content and further training, i.e., to formulate it in terms of socialisation theory: the redefinition of the connection between basic psychosocial skills and specific vocational skills in the course of a career. Mertens defined it thus (1974, p. 40): key skills are knowledge, capacities and skills of a kind such that they do not make a direct and delimited contribution to particular disparate practical activities, but contribute, rather, (a) to aptitude for a large number of positions and functions as alternative options at one and the same time, and (b) to aptitude for mastering a sequence of (usually unpredictable) changes in requirements in the course of one's life. He was attempting to outline skills that go beyond concrete tasks, relate to life as a whole and correspond to the change in vocational requirements. As Bunk et al. (1991) note, this concept has its origins in considerations of economic and labour market policy, concerning the rapid obsolescence of specific specialist knowledge on the one hand and which assume, on the other, that long-term predictions cannot be made about trends in the labour market nor about technology.

The problem of clarifying the relationship between psychosocial skills and specialist vocational skills has been apparent ever since the inception of vocational training. Today, however, the concept of key skills signals a demand arising in all service-based societies for a new type of skilled worker in production, services, administration and government service. The concept of key skills conceals a play on words that can be interpreted in two ways: it is a matter of skills that are not only important as a key to the career path of the individual, but also represent a key function for successful competition with other national economies on the global market.

Further elaboration of this concept brings out the fact that the cognitive/intellectual capacities emphasised by Mertens represent only one important dimension. It is personal and social skills in particular that are becoming increasingly important with the implementation of new information and communication technologies and the redesign of work organisation, with its move towards service-based activities. As a result, in vocational training and further training today, in addition to the social and communicative skills already mentioned, the concept of key skills stresses independence, the ability to work in a team, systems awareness and methodological skills which transcend subject, which are becoming increasingly important as compared with specialist vocational knowledge and skills.

This reorientation and expansion of the skills debate reveals a number of points of contact with the debate on the changes in values, the individualisation of people's lives and the 'new self-employed'. The self-employed are the central element and starting point of key skills (Bunk, op. cit. 1991, p. 368). This continues the trend in the modern world of work for both vertical and horizontal work divisions to be dismantled, and for the average skill requirements to be raised, with the inclusion of initiative. This has already resulted in model projects in the training practice of some large companies, geared to structuring key skills in line with socialisation theory: specialist skills, mastery of subject- and job-based know-how and skills, methodological skills, formal and planning skills and social skills, cooperative and communicative capacities, and initiative.

The conveying of key skills of this kind should contribute to an ability to take action in one's occupation that is complex and susceptible of development. Project- and transfer-oriented training models and integrated training programmes have been established to this end, in which systematic work steps, combined with individual work controlled by the individual, individual work planned by the group and genuine group work, are learned (cf. Dybowski, Pütz, Rauner 1995).

There have also been considerable changes in the ways in which skills are taught and learned. Today, interactive strategies tend to be to the fore. This means that the roles of trainer and trainee have to change from a relationship of discipline-based dependence to cooperative *project setting* and *coaching*.

This is particularly apparent in training situations in which the work process is jointly planned by the group and taught by the trainer. The trainees are expected to share responsibility for the joint planning, for they themselves are responsible for their share of the tasks to be performed. In group work, the individual specialised tasks set are harmonised with one another, and the trainees themselves plan and carry out the part of the task assigned to them and make their own contribution to the conclusion of the overall project. Obviously this way of resolving tasks requires a high level of independence in deciding on goals, and also a broad planning horizon, so that gaps in knowledge which become apparent in the process of carrying out the tasks can be filled by the individual's own efforts, by reciprocal help, and by advice from the trainer.

Key skills thus embody the core psychosocial and cognitive skills necessary for the capacity to act in the context of an occupation marked by the pattern of work organisation which is emerging and in the process of ongoing company modernisation. They can also be understood as the individual mastering the basic rules for action in work processes that serve to ensure the flexible use of vocational experience and updated specialist knowledge in the active shaping of vocational interests and the mastery of work requirements. Seen in this way, social skills, in particular, can help to develop the worker's identity, since they promote social positioning, biographical continuity and internal consistency of individual action.

Theories of vocational socialisation stress the value of methodological and social skills to a successful career pattern in the modern world of work. Naturally, specialist skills and experience-based knowledge of an occupation are also necessary for work with new technologies. In view of the rapid rate of innovation in hardware and, in particular, software and the variety of organisational structures, which are also susceptible to change, encompassing computer-supported work, abstract and flexible thinking, combined with a willingness to cooperate and initiative, is becoming increasingly important. Hence key skills also serve to root specialist know-how that rapidly becomes out of date in an individual strategy for adaptation and renewal, and to facilitate dynamic interaction with knowledge, self-critical processing and a constant transfer of work experience.

The increasing weight attached to knowledge which transcends subject and to planning and social skills suggests a shift from the traditional manual and technical work skills and training in them to cognitive/abstract and communicative skills, in other words to *brain and relationship work*. Companies equipped with computer-supported, flexible design and manufacturing systems and flat hierarchical structures require an integrated understanding of the work process as a whole, and combine this with new divisions of labour (cf. Schumann et al. 1994). These include the well-known example of partially autonomous work groups in the automotive industry, whose members share responsibility for work planning and implementation and quality standards. The integration of production, maintenance work and supervisory activities, and the close cooperation which exists with engineers, offer skilled workers, for example, an opportunity to acquire additional skills through their work and in their work. This could result in a new model of skilled workers, for whom diagnostic and communicative skills are as important as craft skills.

Soft skills or social skills of this kind are coming ever more to the fore in service-based occupations and in management, on the basis that it is not what is sold but how it is sold that increases turnover.

4. Competence profiles

Hitherto it was difficult to investigate these trends in skills requirements, formulated in general terms, at the level of key skills for specific occupations. This can now be done on the basis of an overview of skills profiles for specific occupations drawn up by the *Institut für Arbeitsmarkt- und Berufsforschung* (IAB – Institute of labour market and vocational research) (Chaberny et al. 1991). The results of a survey of companies that provided information on general qualities and skills and vocational know-how and skills important in the selection of employees cover 90 % of the training arrangements in the old *Bundesländer*, the former West Germany.

Example: mechanic

The companies surveyed selected the following skills, from a list provided, as being very important: adaptability, coherent thinking, teamwork, tenacity and patience in looking for faults; use of language and physical strength were seen as unimportant. With regard to vocational knowledge and skills, mechanics were expected to have knowledge of hydraulics and pneumatics, to be familiar with machinery and plant, and to have repair and maintenance skills (including analysis of causes).

Example: bank clerk

Particularly important skills were: negotiating skills, tact and discretion, ability to deal with people, sensitivity, use of language and teamwork. The knowledge and skills required of them were the ability to advise customers and hold sales discussions.

If we compare the skills profiles of the two occupations of mechanic and bank clerk, we see that the ability to work in a team is emphasised as an important skill and characteristic in both cases. While use of language (i.e. the ability to express oneself clearly) is seen as relatively unimportant for the mechanic, communication skills are particularly relevant to the bank employee. If we compare all the occupations included in the research, it is noteworthy that the only skill on which they all agree is teamwork, which is categorised as very important in all cases. Pending an analysis of the basic skills included in the survey of employers, differentiated according to specific fields of work, this shows that a fundamental social skill, namely the capacity and willingness to work with other people, is probably a central key skill in the small, medium-sized and large companies of today.

Moreover, it cannot be denied that there is a considerable degree of polarisation in the skills profiles of industrial and craft-based occupations such as mechanics and electricians on the one hand, and skilled workers in business, service and administrative occupations on the other. This is demonstrated by the fact that companies consider the ability to express oneself clearly to be less important for mechanics and electricians, while it is seen as particularly important in business and banking.

What opportunities are there then for the development of vocational skills as the basis of social identity, given the changing requirements of a working landscape that is becoming more complex? In companies operating internationally in particular, work organisation is being restructured by means of programmes of rationalisation. This has led not only to the dismantling of management hierarchies, but also to reductions in employee numbers. Large companies equipped with advanced computerised support systems have developed decentralised decision-making structures, partially autonomous work groups and specific training and further training programmes for their core workforce. This trend supports the assumption that, as socio-technical systems capable of change and dependent on markets, companies are increasingly tending to attach importance to social and communicative skills as a central skill criterion, alongside relevant technical skills and planning methods.

Since the beginning of the 1990s, alongside the propagation of lifelong learning and the increasing importance of international markets, a new skills dimension has been discovered by management consultants in particular, namely *soft skills*. These *soft competencies* are usually differentiated from *hard competencies* by being understood as comprising a range of skills such as interpersonal sensitivity, presentation, communication and cooperation. In 1995, working on behalf of the management consultants Arthur D. Little, who operate all over the world, a *global* project team established nine skills which combine to form a skills profile that would be expected of future management trainees (Bock, in: von Landsberg 1997): self-confidence, teamwork orientation, communication, creativity, tolerance of frustration, self-motivation, cognitive skills, specialised knowledge and methodological know-how. Six of these skills emphasise social/communicative skills, whereas traditional vocational skills and knowledge are less prominent.

Although this list stems primarily from organisation and management consultants, it may still convey a certain impression of what the brave new world of the dynamic company operating at international level understands to be the social identity of modern, flexible and mobile workers.

According to these evaluations, the importance of *soft* as opposed to *hard* skills is likely to increase in large companies in particular, and as the following changes occur:

- hierarchies become flatter and responsibility is decentralised;
- constantly changing management of change becomes the norm, to facilitate flexible adaptation to the market;
- networked work groups and changing project teams or task forces replace rigid staff/line organisations.

At the same time, the degree of integration in, and loyalty to, the company and specific dependence on particular labour market segments are likely to become increasingly important to vocational socialisation and individual employment or career patterns. This trend means that a rigid vocational life plan is likely to be detrimental to the social skills required by work organisation. It may be that it will be people who have successfully coped with a working life involving discontinuities, who have greater self-confidence and tolerance of frustration, who will have improved opportunities in future. This may, however, involve a heavy burden for individual identity, since both social positioning and biographical continuity are placed at the disposal of the company's human resource management, and are thus largely detached from vocational or specialist skills.

The consequences for vocational socialisation of the change in work requirements and skills profiles described could also, however, mean that the trend anticipated by Baethge (1991), that of a *normative subjectivisation* of work, will spread, and that there will be an increase in intrinsic motivation to work and in opportunities for individual control over employment patterns. It is true that personal and social skills have always been necessary for waged work, in the form of traditional work virtues and, in particular, willingness to comply with the authoritarian and bureaucratic rules of the game in the system of company rule, without either completely accepting them or sacrificing them to solidarity with colleagues.

These skills are becoming less important and are forming a new combination with new perspectives on work, which amount to an individualistic, calculated willingness to cooperate, a move, as it were, away from the obligation to work to an interest in working. This means that a high level of performance is expected of employees and job seekers, in the cooperative network within the plant, company or sector. However, individually meaningful and creative work means not only employing one's *soft skills* as a *softener* in the company's interests, but also, if necessary, taking the risk of asking critical questions, seeking new solutions to problems and renouncing patterns of solutions that have become established through previous experience. This cannot be achieved by cognitive and planning skills alone; the latter must become part of a comprehensive vocational skill, by means of which workers can also anticipate and have a longer-term view of the consequences of their own actions in social terms and for the company as a whole.

As a result of the discovery that social and communicative skills are important key skills for the success of a company, employees' personalities are becoming the object of training and personnel strategies, especially at management level. For example, the private European Business School in Germany has devised a personality development programme for management trainees. This programme sets out to promote social skills through study, by using coaches, to provide seminar-based training in planning and decision-making and in cooperative skills and conflict resolution and, finally, to teach intercultural skills, i.e. languages and country studies (Tistler-Kachel in: Landsberg 1997).

One cannot avoid the impression that more and more companies are now coming to regard their employees' specialist vocational skills simply as a necessary condition, but not a sufficient one alone, for the performance of work and business success. In the course of organisational development, employees are involved in personnel development measures aimed at personality development. These measures serve to link the job and career in the company to continuous achievement and a continuous review of performance, on one's own responsibility, and to bind employees in their social identity to an individual plant or a particular company, rather than to an occupation, on which they can exert little influence.

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B. European trends in the development of vocational education and training systems and provision

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Summary and outlook

The chapter tackles eight broad themes. The first two concern aspects of the context in which vocational education and training (VET) is set; the next four consider four key aspects of the systems and provision of initial VET; the final two final themes relate, more briefly, to higher education and continuing VET.

While there clearly are significant areas of convergence – in terms of outcomes, structures and processes – it is equally the case that diversity, even divergence, continues to be an important feature of the map. Thus, for example, some European VET systems are essentially school-based, while others are workplace-based. Also, there are enduring differences in the organisation and role of apprenticeships and the other forms of on-the-job training across the EU Member States.

Thus, while broad pressures (including globalisation, changes in technology and the organisation of work) place pressure on the EU Member States to adopt similar policy objectives, their own institutional structures and traditions – not least labour market practices – mean that diverse or divergent solutions are likely to remain a feature of the education and training scene in Europe, as countries attempt to find appropriate outcomes to some of the key problems that they face.

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Introduction

Since 1996, the European Commission has reviewed its main programmes across the field and we have conducted research into the trends of convergence and divergence that have been taking place in the systems and provision of education and training across the European Union (²). Our remit was to rely extensively on the literature, and we were assisted by a number of consultancy reports. The period in question was the mid-1980s to the mid-1990s.

Our overall conclusion is that in many respects the education and training system of different Member States face common pressures and, in consequence, policy makers are following quite similar general objectives. These pressures include changes in technology and the organisation of work, and the globalisation of the production and distribution of goods and services. Nevertheless, substantial differences still continue to exist in many respects between the structures, practices and outcomes of the different Member States' education and training systems, and these derive from longstanding and fundamental national differences in political institutions, economic and labour market structures, and from knowledge and cultural traditions. Thus, whilst there certainly has been convergence in certain areas, we found that there is little evidence that an overall pattern of substantial convergence has obtained between the current systems of different Member States. In our view, researchers involved in European networks and people involved in the policy process need to look carefully at trends in specific areas. This is, firstly, because the trends are likely to be complex. Secondly, convergence may create auspicious contexts for common action while, on the other hand, continuing national variation may suggest that research and dialogue is useful at the level of aims and objectives, rather than with the aim of moving towards a common action.

We hope that this chapter will be helpful in providing an entry key to some of the broader contexts in which much of the specialised research and collaboration is situated at European level. Our research was conducted within a short time span in order to meet tight deadlines. We hope that it is useful as a contribution, as researchers attempt to move towards a more dynamic analysis at a European level. Certainly, we do not claim to have exhausted our subject area.

The chapter tackles eight broad themes. The first two concern important aspects of the context in which vocational education and training (VET) is set. We then consider four key aspects of initial (or post-compulsory) vocational education and training. Our two final themes relate, more briefly, to higher education and continuing VET.

Since we conducted our research, the European Commission has published at least two important studies in the field. These are *Key data on vocational training in the European Union* (Eurostat and Cedefop, 1997) and *Measures taken by Member States of the European Union to assist young people who have left the education system without qualifications* (Eurydice, 1997b). Both are useful points of reference that can be used to test some of the conclusions that we had reached, and both – while adding some significant perspectives – tend to confirm our conclusions. As the Eurydice study observes:

> 'Disparity (in the political and social perceptions of young people leaving their education and training systems without qualifications) .... must be seen in the context of the differences in the education and training pathways which characterise the countries concerned' (p. 7).

(²) This contribution is based substantially on the findings of a research project carried out at the Institute of Education, University of London, for the European Commission's DG XXII. The views expressed in this contribution are the responsibility of the authors alone, do not necessarily represent the official position of the Commission or of the Member States, and do not implicate the Commission in any field of action. DG XXII is publishing a summarising paper on the basis of our report.

We make reference to these two studies at a number of points in this chapter.

1. Decentralising aspects of management and administration of the education service is a key theme, although the trend is complex

Since the early 1980s, many EU countries have devolved certain aspects of decision-making and management powers in their national education system away from the government department responsible for education to other administrative and management levels. A general policy orientation towards decentralisation of educational administration and control has been evident in the majority of EU Member States. These reforms in regulation and governance have been prompted by a variety of common factors, including financial constraints and the desire to increase efficiency, accountability and effectiveness, and increased social pluralism and parental pressures for 'choice'. A further factor in some countries has been demands for greater regional or community autonomy.

However, the term decentralisation masks a number of different strategies, which are informed by distinctive administrative logics and political rationales. At least six different strategies are apparent in Europe, which respond to these common factors. Strategies may be characterised as follows:

- dispersal of powers to social partners
- regional devolution
- regional deconcentration
- localisation
- institutional autonomy
- marketisation.

In the mid-1980s, the majority of countries would probably have fitted into the *centralised* category. This includes all of southern Europe, France and the Nordic countries, except in some respects Denmark. Only a few States could have claimed to have fairly 'decentralised' systems – notably the UK, Ireland and Denmark – while the system in Austria and Germany was already operative at a federal level. The balance has now shifted, such that a larger group of countries give substantial powers to local authorities and schools – including the UK, Netherlands, and the Nordic countries; while another group distributes most powers between regions, local authorities and, to a lesser extent, schools (i.e. Germany, Austria, Belgium, and to some extent France). However, it should be noted that in a significant number of countries, despite some devolution, the majority of decision-making power remains centralised. Greece, Luxembourg and Portugal certainly fit into this category and, arguably, France and Italy.

Despite the common policy orientations, it is doubtful whether the differences between States in the distribution of public powers have actually reduced. Furthermore, considered from the point of view of public regulation or market regulation, there has clearly been some measure of divergence among Member States. Twenty years ago all of the current EU States broadly subscribed to a *public service* model of administration in the State education system. Now there are distinct differences between those countries that have broadly maintained this vision and those that have adopted quasi-market modes of regulation.

The remarks above refer to trends in the education systems in general, and the centralisation and decentralisation of decision-making and management in the vocational education and training systems may be expected to follow somewhat different logics and trends. The regulation of VET is more directly tied to the organisation of the labour market and, particularly, to the arrangements that link the transition of young people from the school to the workplace. Some systems, including those that operate the dual system, have collectively regulated arrangements for both initial training and entry into the labour market, while in other Member States the linkage is less regulated and more diffuse. Furthermore, in countries such as Spain, it is only through recent reforms that the government has come to play a major role in developing and regulating VET qualifications.

2. Lower secondary education is increasingly seen as giving an entitlement to a broad general education and as a preparatory phase for further education and training

This phase is seen more and more as a preparatory stage for progression to further education and/or vocational education and training. The hallmark of the compulsory, full-time phase of secondary education (in other words, lower secondary education) is, throughout the EU, the acquisition of basic competencies by as wide a range as practicable of young people in the age cohort. In these respects, there is a clear congruence in national policies for this phase (Eurydice, 1997a).

Nevertheless, a diverse range of structural arrangements continues to be in place across the Member States. A key distinction is between States that have developed comprehensive provision and those that have kept selective – or otherwise differentiated – provision. While the comprehensive approach has perhaps gained some ground, there is no marked trend of convergence in this respect. A marked trend has, however, occurred across the Member States of the EU to delay the moment when the young person specialises into tracks or lines within the particular system. Given the different structural arrangements, this trend of convergence is complex, and is certainly not a convergence towards a single set of arrangements.

A broad and balanced curriculum is now seen as an entitlement at this stage. In all the Member States, the demands and expectations made of the curriculum are also growing. There is increased emphasis on traditional basic subjects, including language (mother tongue), mathematics and science, and there is greater emphasis on the learning of modern foreign languages (Eurydice, 1997a). In this last respect, the European Commission has had an influence. Some important new areas appear to be gaining importance, notably, citizenship and information technologies, and an emphasis on key or transversal skills. It is often difficult to know from available research the extent to which these concerns have permeated through to the daily work that schools do.

Each Member State places a strong emphasis on inclusion and on the combating of social exclusion. Thus, the number of young people leaving their compulsory phase without any qualification or without a sufficiently strong level of basic education is seen as a problem in each Member State. There is some convergence apparent here; States with quite high levels of 'unqualified' leaving in the mid-1980s have seen a decline in the unqualified leaving rate. However, it seems that no State has been successful in educating all its young people to what it would see as a satisfactory basic level (Eurydice, 1997b).

Interestingly, there is a marked trend in several Member States – including Denmark, Finland and the Dutch-speaking Community in Belgium – for the whole curriculum to be defined in less prescriptive or detailed terms, and this change is accompanied by an emphasis on objectives, targets or competencies. In turn, these developments are linked to the search for more devolved models of governance and regulation, which we referred to above, and this is an area where common policy concerns are apparent. However, several other States do not appear to have begun to make significant moves in this direction, so that at this stage there appears to be a divergent trend in this respect and, for example, Greece and Portugal have retained strongly centralised systems in these respects.

Reflecting the prevailing view that the lower secondary phase is seen as transitional and preparatory for further education and training, the trend is for end of phase assessment or examination to be of decreasing importance as a publicly recognised certification. Yet, it is likely to remain a key internal determinant of the young person's next, more specialised stage of education or training.

3. Participation in post-compulsory education has grown; this has been accompanied by academic drift and a prolonged – and often more risky – transition to the labour market for many young people

In terms of increased participation and outcomes, there is evidence of some common broad trends and themes across the EU. This reflects common dynamics of motivation and choice among young people, and shared policy objectives among Member States. However, the data also indicate how strong and enduring are the effects of historically established labour market practices and institutions. The latter constrain the operation of education and training policies, and limit the degree of convergence among EU countries in this area. It should also be noted that there is a limited range of quantitative outcome measures for which good quality data are available, over a time period and for all or even most Member States. This situation is improving gradually, but underlines the importance of continuing and, indeed, increasing research at European level.

The European norm is now one of extended participation by young people in education and training, well beyond the end of compulsory schooling. Data on participation rates confirm the near universal participation through lower secondary levels, rapidly increasing participation in post-compulsory education and training, and rapidly increasing enrolments in higher education. There is clear convergence here, although it may be masked somewhat by the differential timing of demographic changes, and in the ages at which entry, transitions, and exits take place. A corollary is the drop in the absolute proportions leaving with no or minimum formal qualifications, even though this remains, as we have already indicated, an important problem for all the Member States. Again, these are convergent trends.

However, the data also indicate that there is no straightforwardly convergent trend in participation. Some apparent divergence in trends reflect the fact that Member States' demographic changes are not synchronised. Others, however — notably in higher education — indicate continuing divergence within the overall upward trend. While increases are general, differences in rate added to differing starting points have in some respects left countries as far or further apart in the mid-1990s as they were in the mid-1980s.

Member States are alike in experiencing a move to longer post-compulsory courses and to young people accumulating a *portfolio* of different post-compulsory qualifications.

In spite of the emphasis place by governments on developing vocational courses, the ratio of young people opting for upper secondary general to those selecting vocational courses has by and large remained stable, and this masks a general phenomenon of academic drift. This is manifested partly in a rise in the absolute numbers selecting academic options, while vocational course enrolments increase at the same time and as part of the phenomenon of higher overall participation. Equally important are changes in the use made of vocational qualifications and in their content. Vocational qualifications are increasingly seen and used by young people as a route to further formal study. Reflecting both this and the demands of the labour market, there is – as we indicate in the next section – a common trend to increase the general educational content of vocational programmes. Our conclusions here are confirmed in a number of respects by the data contained in the recent joint publication of Eurostat and Cedefop (Eurostat and Cedefop, 1997).

The transition from school to the labour market became an insecure and risky set of changes for a high proportion of young people, as unemployment grew through the late 1980s and the early 1990s. As the European Commission's White Paper (European Commission, 1995) put it, the upheavals that have occurred in European economic activity constitute 'a trend which has increased uncertainty all round and for some has led to intolerable situations of exclusion' (p. 5). We have already referred briefly to measures to combat social disadvantage and exclusion adopted during the compulsory phase. Clearly these can have the benefit of taking place at a preventive rather than at a remedial stage in the young person's career, and before the transition to the labour market takes place. A later section will look at alternance as an approach to tackling exclusion that is currently receiving a good deal of attention in many of the Member States. In its recent analysis of measures adopted to assist young people who leave the education system unqualified, Eurydice usefully distinguishes between three kinds of measures. Firstly, there are those that are developed and provided within the education system, which may aim to provide general education and/or skills geared to particular occupations. Secondly, *mixed* programmes involving vocational training and education targeted at the social and economic integration of the unemployed, with the possibility of a qualification; we deal a little further with these in our analysis, which follows, of alternance programmes. Thirdly, courses aimed at the social or vocational integration of the unemployed – varying from help with job seeking to immersion in working life, often without carrying formally recognised qualifications (Eurydice, 1997b).

4. In most Member States there remains a sharp difference in status between general (or academic) education and vocational education and training (VET), although governments are attempting to make their systems more flexible and to achieve the elusive task of raising the status of VET

In spite of increasing participation rates, a strong distinction between the status of general and vocational tracks continues, and in most Member States this is reflected in the real hierarchy of income and other rewards that individuals tend to accrue when they hold a particular kinds and levels of qualification. Governments have been at pains to attempt to raise the status of the VET, and different governments have tried different approaches to this problem, which seems, nevertheless, to remain obdurate.

Policy is motivated by three common considerations, whose weight varies from one Member State to another. These are: to reflect the changing demands of the economy; to make movement between different tracks a practical reality; and, to improve the status of vocational options. It is also worth noting that, while there have been major changes in the content of vocational track curricula, there was very little change in the structure of content of post-compulsory/upper secondary academic curricula in most of the Member States over the period we looked at.

The curriculum changes introduced in Finland during the 1980s are typical of those that have been introduced, more or less quickly, into every Member State during the period under review. The curriculum of vocational institutions was redesigned to introduce more general education, and make the coverage of the two tracks (academic/vocational) more similar. The Finnish reforms also crystallise the limitation of this approach taken in isolation (and explain why a further set of experimental reforms is now under way.) Numminen and Virolainen explain that, while the overarching aim was to make vocational education more attractive, 'the broadening of the vocational curriculum was basically the only thing that happened.' Otherwise upper secondary and vocational schools hardly came closer, and the proportion of young people entering general upper secondary schools kept increasing.' (1997, p. 98).

In countries such as Luxembourg and France, where technical/vocational courses at this level always had a very high general education loading, the changes have been relatively small; but all in the direction identified. Similarly, in Denmark, all vocational and technical qualifications have traditionally included strong general education elements (for adults as well as the young); and the trend has been simply to increase what already occurred. In the UK, the introduction of GNVQs (and in Scotland GSVQs) involved greater emphasis than in older college and school-based vocational awards on maths *(Application of Number)* and English *(Communication)* although the qualifications remain extremely specialised and low on general education by EU standards. The reforms currently being implemented in Spain, under LOGSE (3), provide for a complete restructuring of post-compulsory provision, with the creation of a technological option within the new upper secondary baccalaureate programme. This school-based route is the way into upper vocational training *(Higher Level Formative Cycle)*; is seen as the main route for future skilled workers and technicians; and means that the students who previously entered the older vocational options will now in practice receive a much more general education.

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(3) Ley Orgánica de Ordenación del Sistema Educativo (Law on the General Regulation of the Education Sustem).

This increase in the general education content of vocational courses largely involves established subjects, including an increase in the role of mother tongue, mathematics, science and modern foreign languages. Thus, in Sweden – where the upper secondary curriculum has undergone a thorough revision and there is closer integration between vocational and academic *(study oriented)* programmes than in any other Member State – the main change is to increase the time spent on Swedish and maths by vocational students, and to integrate everyone's studies in these areas into an overall upper secondary syllabus.

The rather conventional nature of these curriculum changes (and the largely stable curricula in academic tracks) may seem somewhat surprising given the general concern of policymakers with curriculum reform, and with the development of critical thinking, higher-level competencies, and the like. Thus, for example, the concept of *key qualifications* has been widely discussed in Austria and Germany in the context of the dual system. The idea is to develop and accredit 'expert know-how, social competence and self-competence' (Reisse, 1996a; Reuling, 1997); but the emphasis is on these as *inputs* – i.e. on designing particular curricula in ways which will encourage students to develop and demonstrate the relevant skills in a particular occupational (or academic) context. In England and Wales, the assessment criteria for General National Vocational Qualifications (the school-based vocational track) give equal weight to students' planning and evaluation skills as to their subject knowledge. In Sweden, there has been a growing emphasis on project work within the curriculum, and on issues such as environmental and international questions within the subject of nature studies. Even this level of change is not universal. In Greece, for example, in spite of discussion of reforms at the level of the upper secondary certificate, the assessed curriculum in almost all subjects remains one of traditional learning based on centrally approved textbooks. The whole question of key or transversal skills is, as we have already said, worth further and critical consideration at European level.

The growing demand for higher levels of general education, and for access to higher education, has led, throughout most of Europe, to the creation of formal pathways between vocational and general programmes. These are conceived of largely as a way of enabling vocational students to proceed to higher levels of study. The intention has been only secondarily, and in some countries, to open up vocational options to general track students. In practice the flows in the general-vocational direction (e.g. *bac général* to *bac techno* or *bac pro*; VWO to MBO) are generally larger in absolute terms. The motivating force has to open up opportunities, but also to maintain recruitment into vocational tracks, which might otherwise become non-viable. At the same time the number of vocational options is generally being reduced, as courses become less trade or job specific.

While the trend to diversification is general, the mechanisms are a function of national institutional structures. In predominantly school-based national systems, where access to higher education is tied to particular diplomas, governments have redefined vocational certificates as acceptable for tertiary studies, subject to various conditions. This pattern characterises, for example Sweden, France and Belgium, and the Spanish reforms are following this same pattern.

The pattern in States where apprenticeship remains highly important is rather different. Here new pathways are intended actively to maintain the popularity and quality of recruitment into apprenticeships, not simply meet demands for progression routes from more or less reluctant vocational students. In Germany, the dual system has adapted considerably in the decade under question; and while apprenticeship has not in the past offered a route into university studies (4), experimental programmes are now developing routes into tertiary education through apprenticeship. More generally, the extension and strengthening of the *Fachhochschulen* has provided an important progression route with its own recognised and substantial value for German students who have successfully completed the *Realschule* certificate and the (new) apprenticeship certificate. The *Fachhochschulen* in Austria are intended to provide a similar pathway, since they can be entered without the Matriculation Examination; but are of much more recent date. Equally significant are the changes that have taken place in apprenticeship itself, and which make a 'fast track' option available to entrants with the *Abitur*. This change has helped integrate apprenticeship with both academic upper secondary and with higher education; so that 15 % of dual system entrants in 1995 had their *Abitur* (5). In Austria, the *Berufsmatura* is being introduced, designed to give both dual system students and students in the full-time vocational schools greater access to tertiary education.

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(4) While a variety of links are developing into the polytechnic sector — the *Fachhochschulen* — university entrance remains clearly linked to the *Abitur*.

In terms of integrating the national regulatory bodies, the United Kingdom and Ireland have, within the last two years, merged the separate statutory bodies responsible for non-university academic and for vocational qualifications into a single body (TEASTAS in Ireland, QCA in England and Wales, SCA in Scotland). This recognises the increasing blurring of routes; the growing demand for progression pathways; and also the continuing low status of traditional vocational awards. These countries are, however, in a rather different position from other Member States with respect to the way diversification of pathways occurs.

While the number of pathways through initial post-compulsory education and training have increased and diversified, the number of distinct vocational options has generally decreased. We again identify this as a convergent trend, in spite of attempts by individual States to adopt the reverse strategy. The trend is convergent and well established, because it reflects both the demands of the labour market, and the demand and interests of students themselves. Consolidation has been particularly apparent in the centrally designed school-based systems where it has taken place as part of the same process of general upgrading of content, and creation of clear routes into tertiary studies. Thus, the Swedish reforms implemented in the early 1990s, for example, created an integrated upper secondary school with 16 *national programmes*, 14 of them vocational. Previously there had existed 28 lines and 172 vocational options. The Finnish reforms of the 1980s reduced vocational options to 26 basic programmes (albeit with 250 specialist options within them); and the new reforms involve a further decrease in the options offered. In France, the many different CAP certificates – the traditional artisan qualification – have, over time, been grouped around the much smaller number of BEPs; which in turn lead into a limited number of *bac pro* options. Consolidation programmes are also under way in the Netherlands, designed to provide a 'coherent and flexible qualification structure through integrating different disciplines in large schools' (Voncken and Onstenk, 1995).

One of the characteristics of modern industrial economies is the enormous variety of occupations and the tendency of firms to be highly specialised and diverse in their activities, even within a sector. There is, therefore, something of a tension between the need for individuals to be highly flexible and broad in their skills, equipped for a labour market where change is constant, and the immediate requirements of employers. Small employers in France, for example, express dissatisfaction with the reduced practical content of the CAP (the traditional artisan qualification), because they see its growing integration into a more general education-oriented system as reducing its value to them (Rapiau and Wolf, 1993).

In the area of assessment and certification, the trend is, at the level of policy discourse, to emphasise the importance of validity in vocational assessment, and an interest in competencies and accreditation of prior learning. However, at the level of practice and implementation, the only clearly convergent trend is to greater systematisation of vocational assessment, and a greater involvement on the part of national governments in the development and regulation of vocational courses.

A longer-term view of policy responses to the disparity between general and vocational education tracks is taken in a Leonardo study exploring reform strategies used by Member States to attempt to achieve parity of esteem between general and vocational education and training in the upper secondary phase. In the eight-country study, four strategies are found. The research team calls these, respectively,

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(5) Information from Federal Ministry of Education, Bonn, 1997.

enhancement, enrichment, linkages and unification (Lasonen and Young, 1997).

5. A policy priority for many EU Member States is now to help form closer links between the education sector and the world of business and industry, although innovation in this respect needs to pay close attention to the particular labour market and how it works

Work-based routes through initial VET – apprenticeship and other kinds of employment-based training – remain highly diverse. Here it is useful to distinguish between the main types of initial work-based training. Firstly, apprenticeship means working in a company under contract with vocational training, often complemented by broader training given outside. The dual system is characteristic of Germany and Austria, where the contracted trainee must attend school as part of the regulated arrangement; in some important respects the dual system is a distinctive version of apprenticeship. Finally, alternance means that periods in a company and in a training organisation alternate, often involving short work-experience placements (Bertrand et al., 1994).

Taking, for the moment, apprenticeship (including the dual system, but not alternance) into account, we can identify different categories according to status and participation levels. Member States are to be found in four groups, and the groupings have remained static over the past 10 to 15 years. The absence of convergence in this area underlines the strong and enduring effect of labour market structures on education and training systems in the Member States.

Member States have generally moved to increase the general education component of apprenticeship, and to make it fit better with other pathways, as implied above (6). However, this common trend has not affected the basic distinctions in the nature and role of apprenticeship between countries. Here, Member States can be divided into four groupings:

a) High status, high participation

In this group of countries apprenticeships enjoy status and respect, and play a central role in the way the labour market functions, including that for leading edge companies. The best known example of this type is Germany with its dual system, which has been described extensively elsewhere (7). Observers of the Austrian dual system consider the status of apprenticeship to have declined in recent years and it not as respected as in Germany, nor is expenditure per apprentice as high. It nonetheless retained its share as a percentage of the age group in full-time education and training between 1984 and 1994; but in the last few years has suffered a small proportional decline. Recent moves are intended to bolster the system; and it retains a very high share of young people compared with almost all other Member States. Finally, in this group, Denmark has attempted (through the new vocational education act of 1991) to integrate a long-established and strong apprenticeship tradition involving a contract with a firm with the essentially school-based system of EFG (*erhvervsfaglige grunduddannelser* – basic vocational training.) Apprenticeships remain important and sought-after, especially in technical sectors, although changes in the nature of production have meant a shortage of places in recent years.

b) Moderate to high status, moderate participation

In a second group of countries, initial post-compulsory vocational education and training involves a mixture of paths, with a fairly complex pattern of status and desirability. Apprenticeship tends to be associated with a limited number of sectors, mostly craft and technical;

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(6) In fact, the introduction of general education components into a work-based programme, and the structuring of the relationship between the workplace and the off-the-job component can often be contrasted with alternance programmes where what happens on the job is effectively unregulated and a completely separate add-on to general education programmes.

(7) We found that the German dual system appeared to be at least as stable as other systems that are current, although we note with interest the debate over tensions within the dual system. These are flagged up, for example, in a contribution to the Cedefop/OECD publication on apprenticeship (Lutz, 1994).

but in some of these, it can enjoy rather high status, and offer apprentices the opportunity for progression to higher education and managerial careers, as well as to highly-paid skilled worker status. At the same time, many young people following this latter route will do so via full-time schooling. The UK and the Netherlands exemplify this pattern. The Netherlands has an unusually complex structure for upper secondary education, and by EU standards there has also been a relatively small drift towards pre-university academic upper secondary track (8). Within this structure, post-compulsory full-time school-based vocational education (MBO) and apprenticeship have coexisted for many years. Apprenticeship has been, traditionally, especially important in the (male-dominated) craft and technical areas, and has enjoyed its own progression routes, with elementary and advanced courses which feed into part-time tertiary courses expressly for apprentices. In the past decade, apprenticeship has maintained its position in status terms and has increased its numerical and proportional share of the cohort.

c) Low status, moderate participation

In the third group of countries, apprenticeships are relatively numerous, but are regarded as definitely less desirable than school-based pathways, and have become in most cases the last choice; the destination of young people who have not dropped out of the system altogether, but who are failing to cope with, or rejecting full-time education.

In numerical terms, the largest example in this group is France. Apprenticeship in France is well-established, enrolling about 10 % of the age cohort (and considerably more in some regions); and is a fully regulated option, involving clear contracts with the employer, as well as a highly specified curriculum, delivered in well-resourced *Centres d'Apprentissage*, and leading to the same qualifications as would be taken in the full time vocational lycées. However, it is also regarded as of very low status; and – until recently, at least – efforts by successive French governments to change this hierarchy have largely failed.

d) Very low participation, low status

Finally, in a number of countries, apprenticeship has in effect vanished except as a part of the sort of alternance-based *remedial* programmes aimed at combating exclusion and drop-out, and discussed below. Among Member States, Belgium, Finland, Greece, Ireland, Luxembourg, Portugal, Spain and Sweden belong to this group.

Overall, the most striking conclusion to be drawn from the literature on apprenticeship is how stable the status of apprenticeship systems, and their role in youth trajectories, has proved to be. Having observed that Member States were all in the same grouping (a, b, c, and d) in 1994 as they had been in 1984, the policy implication for governments must be that the success of apprenticeships depends heavily on labour market practices, and these are resistant to centralised intervention.

6. New forms of alternating training (alternance) are of particular interest to a number of Member States

A common thread in policy discourse over the period under review has been the value of workplace experience and work-based training. This is far from being a new theme, and is, of course, the central rationale for the apprenticeship systems discussed above. However, as more and more students stay in full-time education for prolonged periods, concern has increased that formal education provides only a limited preparation for working life. This concern is fuelled by frequently voiced criticisms from employers. One way in which governments have responded is through a general increase in the role assigned to the social partners, especially employers, in VET as a whole, and particularly at national level; Greece and Italy are exceptional in not doing so to any significant degree. There is no wholesale convergence in this respect, but such changes as have occurred (e.g. in Spain, the Netherlands, the UK) have all been in the direction of greater involvement.

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(8) This is related to the opportunities for tertiary vocational education available through vocational routes, including apprenticeship. Of school-based MBO students, approximately 40 % currently enter tertiary study.

Moving beyond the area of policy discourse and consultation, two types of alternance programme can be distinguished, other than the full apprenticeship programmes referred to above. We agree with Merle of CEREQ (Merle, 1994) that it is important to distinguish between alternance practices which are 'aimed at offering those with low academic levels an alternative to the traditional mechanisms of vocational education and training' and 'Practices aimed mainly at familiarising students with the concrete conditions of their future work situations.' (9)

Provision for both these groups is increasingly in evidence in Member States. The first essentially involves *emergency measures* to youth unemployment, rather than reflecting a coherent philosophy for initial training. While the ratio of adult to youth unemployment rates varies considerably between Member States, as a general rule unemployment rates are significantly higher for young people than for adults. The major exception has been the German-speaking countries, with their established dual systems.

Alternance as an emergency measure

Poor labour market prospects are undoubtedly one reason for increasing participation rates in education, although their effect should not be exaggerated. What is undoubtedly the case across the EU, however, is that the combination of educational and labour market trends has created a situation in which there exists, in every country, an identifiable group of disadvantaged young people from whom the young unemployed are increasingly drawn. We touched on this important problem, in our earlier discussion of the risk for many young people in the transition between school and work. The problems of exclusion are both familiar and also highly intractable. Looking back to the typology set out in the last section, this group overlaps with that identified as Group D: those employed (increasingly rarely) or unemployed, but without any qualification. Governments have tried to reduce the size of this group by a number of mechanisms, including development of special school-based programmes (e.g. in Sweden) which do not lead to qualifications but help to re-insert some participants into mainstream programmes; by encouraging more apprenticeships (e.g. in the Netherlands); but also, commonly, by setting up special measures outside mainstream initial post-compulsory education and training, such as the traineeships recently launched by the government of Ireland as an option for the shrinking proportion of young labour market entrants who have not undertaken any tertiary study. The recent Eurydice publication provides a useful examination of assembled information on both apprenticeship and alternance, though not on a historical or trend-related basis (See Eurydice, 1997b). These special measures may include wage subsidies targeted on the young, and commonly include special training schemes with smaller or larger components of workplace-based experience, for which employers are paid from government funds. Males are generally over-represented in this type of programme.

In Italy, for example, there has been no opportunity for participants on training schemes to obtain any formal award. Although it is generally difficult in Italy to distinguish between apprenticeship schemes and other government initiatives targeted on young people and intended to help them enter the labour market (Bulgarelli and Viovine 1994), in neither case is there a well structured or regulated route to qualifications. Which are offered, and how many, has most to do with the financial and tax incentives and requirements faced by employers. Thus, the proportional relationship between special measure and apprenticeship places has been correspondingly volatile, with the former (*contratti di formazione e lavoro*) soaring from 103 000 in 1985 to 530 000 in 1989, and then back down to 135 000 in 1993.

Evaluations of such measures are generally not encouraging (Breen, 1991; Ryan and

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(9) Merle also has a third category, which corresponds roughly with what we have classified as apprenticeship: namely 'Practices aimed at making the work activity the central locus for acquiring and developing occupational skills.' However, in the context of the current analysis, we feel that the employer–apprentice relationship is the key feature in elaborating where European systems do or do not demonstrate convergence, because it underlines the importance of labour market structures.

Buechtemann, 1996). While many participants may, eventually, find employment, there is little evidence that their chances are improved in any significant degree by the measures, which are rather serving as parking places for their participants. For the purposes of this report, the important thing about alternance in the context of such programmes is that it derives from an economic and employment crisis rather than from trends intrinsic to the main role of initial post-compulsory training. These programmes are seen by participants and non-participants alike as separate from (and inferior to) mainstream education and training.

Pedagogically-inspired alternance programmes

It would be an exaggeration to describe this second type of alternance practice as an area of clear convergence. The different extent and nature of what is involved means that, overall, the degree of difference among Member States is in this respect at least as great at the end of the period as it was at the beginning. Nonetheless, there is definitely a common trend towards emphasising and, less often, realising alternance in non-apprenticeship settings.

Alternance in school-based programmes has not been a major priority for those systems in which apprenticeship plays a major role. Here, the apprenticeship system is the major focus for upgrading processes and for the encouragement of the desired pedagogy and learning. Furthermore, although in the school-based system of Italy there have been experimental programmes involving students from the *Istituto professionale* in training stages in firms – and the same is planned for Greece – in neither country is this a central focus for school-based programmes. In England and Wales, there is a rather curious dichotomy between the requirements for National Vocational Qualifications (the highly specific awards) and General National Vocational Qualifications. For the former, certification requires a great deal of *authentic* experience, although full simulation can sometimes be accepted in place of assessment in the workplace. However, the latter, school-based awards – which are young people's main choice for initial post-compulsory vocational education – do not require work experience, though individual institutions often arrange some.

By contrast, in Spain – where there is a highly school-based, statist tradition —, alternance practices developed widely during the 1980s and 1990s and are institutionalised under LOGSE (Marhuenda et al., 1996). The Alternance Training Scheme (activated in 1984 using regulations first promulgated in 1976) allowed students in their last year of vocational studies to undertake workplacements of up to 200 hours. While the initiative was voluntary, Marhuenda notes that, in spite of concerns about the use of young people as cheap labour, evaluations of the schemes found the content was considered satisfactory by everyone involved, and that it greatly improved the image of vocational education, especially among employers. The Alternance Training Scheme now provides the basis for what will be a compulsory part of the VET curriculum across Spain, at intermediate and higher levels. The FCT (workplace training unit) provides for workplacements of up to 60 days, and will be formally assessed. The proposed Spanish model is very similar to that used in France for the *bac pro* which has now been in operation for a decade. This, too, has a compulsory alternance element: students are required to spend a total of 16 weeks in a workplace related to their area of study, at the end of each period their employer must complete a formal (though relatively unspecific) assessment. The Irish reforms launched in the Green Paper of 1992, *Education for a Changing World* (Government of Ireland 1992), also give prominence to alternance practices, and all vocational education or training programmes at senior secondary level or beyond are to be designed on this model. Similar discussions have been taking place in the Netherlands.

7. Rising levels of participation have also led to the 'massification' of higher education, and EU Member States are seeking to develop new kinds of HE courses and more flexible entry methods. Developments in higher education are likely to be

a major focus of the next few years, as attention turns to lifelong learning and responding to new social, economic and labour market realities

All Member States have experienced major increases in absolute numbers participating in higher education. However, rates of change, and actual participation levels, remain varied.

Modes of access also vary, although States are alike in that expansion has largely benefited the middle classes. This common trend on access reflects a common failure to achieve any major shifts towards easier access for students from blue-collar or disadvantaged homes. Access is affected by the nature of selection and entry requirements, and diversity continues with respect to both initial access and pathways through the system overall. Pathways into the various systems are variously restricted in all countries, although the European Baccalaureate is recognised in all Member States of the European Union. Countries can be grouped into three categories: those where universities set their own entrance tests (e.g. Spain); those where there is competitive entry for courses tied to performance on end-of-secondary school certificates and examinations (e.g. Sweden, Belgium, Netherlands, Ireland, UK) and those where there is very wide access on the basis of the attainment of the university-entrance certificate (e.g. Germany, France). At one extreme, Belgium places no limits on student admissions once the basic certificate providing for entry is achieved, and at the other there is a mix of *numerus clausus* or other restrictive admissions policies. Portugal and the United Kingdom along with Greece and Ireland are among the most rigid in their admissions criteria and policies (Eurydice, 1993). Finally, higher education systems also continue to vary dramatically with respect to the way pathways through the system are managed. In the case of Sweden, the Netherlands, Finland and, increasingly, the United Kingdom graduation is by credit accumulation. This should be contrasted with the 'stage' model of France or Belgium where progression to subsequent years is dependent upon demonstrating competence before at the end of each stage. In contrast, the emphasis in the German and Austrian systems is upon a major examination at the end of the course.

There is also continuing diversity with respect to average length of time spent studying in university. Although the period has generally tended to lengthen, in accordance with the trend to prolonged and diverse study and labour market entry noted elsewhere, there remain major differences in the percentage of the age group in tertiary education.

At structural level, there remain major differences between countries with a clear binary divide, and others with unitary or institutionally diverse systems. No convergent trend is evident. Belgium, Portugal and Greece are among the countries that have maintained a binary system; while Austria created and Finland strengthened a binary divide during the period we are concerned with. On the other hand, Sweden and Italy have retained unitary systems, while the UK abolished the divide between universities and polytechnics. A number of countries have strengthened their vocational HE courses, and experimentation with shorter HE vocational courses has taken place, for example, in France.

Other trends are more clearly shared, and display convergent responses to the changing international scene. The internationalisation of higher education is a global phenomenon, but also one which is marked within the EU itself; recognising the upgrading of skilled, professional labour that the global economy requires. EU programmes have assisted a process of convergence, which has been framed by the legal requirement of equal treatment of EU citizens to work in any Member State, to teach, to learn, and to have their diplomas recognised. The results have been a growth of institutional flexibility, curriculum change, increased use of information and communication technologies (ICT)-based and open-learning provision, and large-scale involvement of students, teachers and researchers in working across national boundaries.

Management and quality control have become priorities for all Member States during the period reviewed, and the systems employed have changed quite dramatically in a number of cases. Key questions for the future in this respect are whether appropriate partnerships can be worked out between governments, the HE sector and industry, and how flexibility of entry, process and transition can be developed as a focal point of lifelong learning.

8. Even though there is a strong emphasis on lifelong learning, the vocational is tending to dominate the general in continuing education and training

We are sure that this area is one where further research is of great importance as a basis for informed decision making and Community-level collaboration. At present, information remains sparse, although recent EU-wide initiatives (see, for example, Brandsma et al., 1995; Ant et al., 1996) have been very helpful in providing a better understanding of practices in the individual Member States.

Lifelong learning is of enormous interest to all Member States, and is perceived as a priority for policy and for national economic and, increasingly, social well-being. In this, national governments recognise and share the objectives identified in the White Paper *Teaching and learning: Towards a learning society*. However, States are also alike in possessing very little reliable data of their own on current provision and practice. Our analysis confirms that inequality of opportunity and access is marked; throughout the EU, the more educated and those in managerial and professional jobs are more likely to receive further training, and the least educated and those in low-skilled jobs, the least likely. Member States are also alike in that training opportunities decline with age. There are major inter-sectoral differences and continuing training is more likely in large firms. Very few SMEs have developed systematic policies. However, sex differences in access are no longer apparent.

It is clear that there have been large increases in the volume of activity in this sector. There is also evidence of convergence with respect to the importance of vocational training compared with general education. The former is growing; the latter, while not declining in absolute terms, is a less important part of the whole. This shift reflects, and is probably largely due to, government policies, and the shared emphasis on continuing training as a tool to provide economic growth.

Although the evidence base is unsatisfactory, it appears that – beyond some clear patterns of participation – there is little evidence of convergence in the provision of continuing training. What States appear to have in common is that, in each case, provision involves a wide variety of suppliers. There remain large differences between States in social partner involvement; the role of universities; opportunities to obtain formal qualifications during further training; and the absolute likelihood of receiving training (¹⁰).

The emphasis, naturally enough, of most continuing training is employers' priority of providing further training to raise the skills of employees who already add value and learn efficiently. The challenge is to find ways of developing worthwhile and effective programmes for other groups, particularly those facing disadvantage and exclusion.

Conclusion

In this brief survey of a broad field we have indicated the outcome trends, but primarily we have attempted to point up the dynamic processes that make up both convergence and divergent trends in the European systems. As European-level research continues to develop from a descriptive to a more analytical and, eventually, a more dynamic mode, we have attempted to draw together a number of focuses and typologies that can assist this process.

Of course, there are clear areas of broad convergence, and we have drawn attention to some of these. At the same time, the European systems of education and VET show energetic signs of remaining divergent (or, simply di-

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(¹⁰) One of the authors, Andy Green, is currently conducting work for OECD on this area. Unfortunately, it is too early yet to be able to feed the results of this work into the present analysis.

verse) in some key aspects. Important among these are:

- the ways in which decentralisation is taking place in the different systems;
- the differences between comprehensive and selective systems in the compulsory phase;
- VET systems that are essentially school-based and those that are workplace-based;
- enduring differences in the organisation and role of apprenticeships and the other forms of on-the-job training across the EU Member States.

Finally, at least so far as the last two of these categories are concerned, it seems clear to us that, while broad pressures (including changes in technology and the organisation of work) place pressure on the EU Member States to adopt similar policy objectives, their own institutional structures and traditions – not least labour market practices – mean that diverse or divergent solutions are likely to remain a feature of the education and training scene in Europe, as countries attempt to find appropriate outcomes to some of the key problems that they face.

References

The full report includes a 25 page bibliography, containing some 500 references to sources used. This included the full range of titles published by the European Commission and its agencies, notably Eurostat, Cedefop and Eurydice, and the wide range of OECD publications. Here we only reference the sources quoted directly in this contribution. Clearly, however, the full range of references has helped to shape our work and to shape our conclusions.

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C. Competence development and the environment: the contribution to job creation

Catherine Gay (1)

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Summary and outlook

The object of this paper is to analyse the specific role played by the supply of new skills in regard to setting up and running certain innovative actions in the field of employment and the environment. It is concerned mainly with the skills of the project leader, but also those of all the actors involved, whether institutions or employees.

The study of what enterprises, local authorities and associations have already achieved in the form of innovative environmental and employment actions shows that the project is the preferred option. These innovative actions have a real impact on employment, and the 'project' dimension is decisive to job creation. Indeed, assuming a same environmental objective and a same profitability constraint, the job-creation content may differ widely depending on the options chosen. This project dynamic is based on the emergence of new social actors such as social economy enterprises, the building of new partnerships and the establishment of regional/local projects incorporating a variety of aspects (environment, employment, democracy, urban networks, etc.).

The various research projects we have carried out seem to suggest convergent trends among a wide variety of project leaders, such as technical officers, founders of enterprises, elected representatives, etc. The project leader, whatever his status, is the 'keypad' of the pilot action.

In order to carry out the activities of establishing and setting up a project, a pool of common skills is required, especially in the fields of project management, mediation, conduct and communication, organisation and management.

The project leader must plan the project strategy, incorporating in it the requirements of sustainable development and the training of the various actors. The transverse skills linked to the strategic and planning aspects, together with those linked to communication and raising public awareness, are also of capital importance.

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(1) CG Conseil

The skills described above are vital to the achievement of these job-creating projects in the framework of a territorial or corporate strategy.

Companies or local authorities that set up an environmental project need to improve the awareness and information of all the employees or actors involved and then to train them.

The training schemes set up to respond to the new requirements can also form part of a project. Training therefore becomes a component of the project, in the same way as advice, communication or the technical study of an environmental diagnosis. The training is often targeted at all the actors involved rather than at a specific group of people.

Indeed, the technical qualification of a particular category of employees is less important now than the acquisition of transverse skills and setting up integrated training schemes within projects aimed at actors at a wide variety of levels and with very different skills.

1. Introduction

Much research has been done since 1995 on the interaction between the issues of job creation and protection of the environment.

We now have more exact European data on the environment-related labour market. It accounts for at least 3.5 million employees in Europe (2): 1.5 million jobs in the sector of eco-industries (3) (mainly in connection with water treatment and waste management) and 2 million jobs linked to activities in the area of clean technologies, renewable energy, waste recycling, nature and landscape protection and ecological renovation of urban areas).

This labour market is expanding, with the EU Member States taking a wide variety of measures to encourage the growth of pollution control services.

Actions that pay a '*double dividend*' – employment and environment – have been identified, together with the factors that promote this dual impact.

A recent OECD study (4), which makes an exhaustive analysis of the links between the environment and employment, notes 11 factors that are *decisive to the improvement of the state of the environment and employment*.

One of these factors is the availability of adequately prepared and skilled human resources at all levels (management, operation, etc.). In effect, it was found that new skills were needed at a wide variety of levels.

The object of this paper is to analyse the specific role played by the supply of new skills in regard to setting up and running certain innovative actions in the field of employment and the environment. It is concerned mainly with the skills of the project leader, but also those of all the actors involved, whether institutions or employees.

After a brief phase involving the discovery of jobs related to the environment and a phase during which new actions were tested, we have now reached the phase of reducing the pilot projects supported by the States and by the EU.

The observation and analysis of the skills involved and of the procedures currently used to acquire them can make it possible to develop them more fully and to identify them more clearly, with a view to reducing this type of action.

Our analysis is mainly concerned with innovative actions, on the margins of the labour mar-

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(2) Eurostat data for the 1997 EU report on employment quoted in the Communication from the Commission on environment and employment (COM(97) 592 final).

(3) Source: *An estimate of eco-industries in the European Union*, Ecotec-Eurostat – DG XI, 1997, quoted in the Commission's Communication on environment and employment, op. cit.

(4) OECD, *Environmental policy and employment*, Paris, 1997.

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ket described above, which provide a new response to the problems of employment and the environment.

The aim is to improve the situation as regards the current environmental hazards described below, as quoted in the Commission's Communication on environment and employment (5):

'While progress has been made, manufacturing industry continues to be responsible for a considerable part of environmental pollution in particular through the use of energy and raw materials and the generation of hazardous waste. In the transport sector, the overall negative environmental trend has continued due to traffic growth and in spite of technological improvements in engines and fuels. In the energy sector, the fossil fuel cycle has significant negative environmental impact, mainly on the atmosphere. In overall terms, present agricultural practices have negative impacts on water levels and quality, and on soil erosion. Although the CAP reform of 1992 had some positive effect, further efforts are necessary.'

The study of what enterprises, local authorities and associations have already achieved in the form of innovative environmental and employment actions shows that a *project logic* is the preferred option. We have taken the *project concept* as the leitmotif of our analysis.

Jean-Pierre Boutinet has specified the four main defining elements of a project: the need for the project worker to 'know what he wants and what approach to take in order to achieve it'; anticipation of the action; the role of the individual or collective actor, who becomes the author of his own project; creativity and innovation (Boutinet, 1993). Adopting this approach to the various types of project, the innovative actions we are concerned with here are collective projects based on a methodology that either tends to focus more on technical innovation or tends more towards participation and social change.

The project concept makes it possible to analyse very different initiatives which, however, tend to converge in terms of the development of skills. Actions such as setting up an environmental management system within a company, creating an activity involving the recycling of office materials or organising a scheme to clean up a river all come under different headings but imply similar new skills for the project manager, be he an employee, the founder of a company or an elected representative.

2. Projects on the local and company level

2.1. The transformation of legal environmental regulations into job-creating development strategies and projects

Both local authorities and companies now face an increasing number of regulatory constraints. It is not always easy to respond to these new legislative requirements, especially for SMEs and local authorities in less favoured regions.

Yet, despite these constraints, some of them have started up innovative projects, whose impact often goes beyond, or anticipates, the regulatory requirements. The Commission's Communication on environment and employment notes that 'there are also a number of well-documented case studies of sectors and firms which have been able to turn the imposition of strict standards into first-mover advantages through innovation, efficiency and productivity gains'. It points out that the Member States are successfully promoting environmental protection initiatives.

These actions fall under three different categories.

1. Actions to improve the environmental impacts of enterprises: introducing clean technologies and reduction of pollution. These actions often involve drawing up an environ-

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(5) COM(97) 592. This analysis of environmental problems refers back to the OECD analyses, to the current and revised fifth Community action programme for the environment and to the evaluations by the European Environment Agency.

mental plan and establishing a system of environmental management and may involve certification: ISO standard 14000 or the European EMAS regulation (⁶).

The projects may be carried out by an industry, an enterprise, a group or an occupational branch.

The eco-industries sector is also affected by the dynamic of projects to improve the environment since it will become increasingly necessary to set up environmental management systems for water treatment, waste treatment, industrial waste recycling, etc. In France, for example, the Agences de l'Eau, the main financiers of industrial water treatment centres, will impose ISO 14000 certification for these facilities.

2. Actions to improve the local/regional environment: protection and development of open spaces and watercourses, organisation of waste recycling, better management of energy resources, prevention of forest-fire risks, noise reduction, etc. The projects can be run by a local authority, a group of local authorities or a region.

The environment has become a component of integrated regional or local strategies: many local projects (relating to a commune, a conurbation or a region or *Land*) and local development strategies incorporate the aspect of job creation in the environmental field. A major feature of these local initiatives is always the social economy: the aim is to help the unemployed or young people without qualifications to obtain a job or position and often also to acquire qualifications. So they come under a different system from the labour market. Even if the results are sometimes modest, environment-related development projects generate a positive dynamic: they create new partnerships in rural areas.

3. Actions to set up new services: e.g. creation of collection and recycling activities, of green services in local areas; creation of enterprises to recycle new waste products or treat polluted land; creation of associations to maintain the watercourses. The projects can be led by the founder of an enterprise, by a social economy enterprise, an association, a local authority, a private firm or a group of firms.

These different categories of actions, however, have some features in common. They integrate into a certain project dynamic. Indeed, the project mangers or actors determine the objectives, actions and the guidelines of the project. Moreover, these actions are the result of a continuous process of construction. For example, studying a number of projects to create new services, we find a constructive process that involves both supply and demand, linked to the emergence of new activities, new technologies or new organisations. Lastly, these actions cut across the various problems faced by an enterprise or local area and require a global strategy. In urban areas, for example, projects related to employment and the environment cannot disregard the complex aspects of democracy, development, new urban patterns and links between the local area and the enterprises.

That means that these projects are embedded into a process of regulating the interaction between the local and global levels. They reflect the links between public policies and the changes in social participation.

In this way, an appropriate environmental and/or employment policy can encourage the development of these projects and at the same time enhance the actors' capacity to transform and develop their activity and create new services. This applies, for example, to the incentives offered by several Member States to young entrepreneurs or unemployed persons who propose a project in the field of the environment.

2.2. The job-creation content of environment-related projects

All these innovative actions have a real impact on employment, even if they do not always achieve the original objective. There are many examples of projects that create jobs: the founding of enterprises or creation of jobs to

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(⁶) The European EMAS (Environmental Management and Audit System) Regulation No 1836/93 of 29 June 1993 has been applicable in all Member States since 1 April 1995. It sets up a labelling system accessible to industrial activities.

provide new services within companies, associations or local authorities.

The Cedefop research programme on new qualifications and training needs in environment-related sectors found that jobs were created in the following sectors: waste management, selective collection of household waste and obsolete goods, recycling of materials, treatment of polluted land and soil, maintenance of rivers and urban ecology.

The project dimension is decisive to job creation. An essential condition for a project's success is for the partners working within the same project to establish objectives targeted at jobs. Indeed, assuming the same environmental objective and the same profitability constraint, the job-creation content may differ widely depending on the options chosen. In waste management, for example, for the same investment sum the labour intensity will differ according to the options chosen.

Olivier Lagadec of the Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME) points out, 'The major changes now occurring in all activities relating to waste raise questions about the technical and organisational choices that are made. These choices do not and will not have the same impact in terms of regional planning, job creation and social cohesion.' Several studies show that, all costs being equal, waste management systems that encourage selective collection and sorting generate more jobs than those favouring incineration or dumping (Quirion, 1996).

Some outcome-based job-creation policies incorporate this project dimension. In France, for example, this is the case of the 'new services – new jobs' programme (7), which promotes environment-related youth employment projects in the context of such a project dynamic. Potential employers are local authorities, public institutions and associations. The State contributes to financing jobs targeted at young people by carrying out activity projects that respond to emergent or unsatisfied needs. The main leitmotif of this programme aims to mobilise the actors concerned in order to identify possible local projects. Technical assistance is provided for participants and actors.

In the environmental field, these new activities may involve environmental education, management of open spaces and water, waste management, controlling consumption flows, renewable energy, organic farming, transport, air quality, noise and the urban environment. For example, some projects established under this heading offer advice and assistance to SME-SMIs in the field of the environment: they account for about 40 jobs in ADEME and many others in chambers of commerce and industry and chambers of trade. In an entirely different field, a group of communes on the coast has set up an 'environment team' for landscape planning and cleaning up the sea.

2.3. New partnerships between a variety of social actors, individuals, public authorities, social economy enterprises and the private sector

A more careful analysis of environment-related projects shows that the two major factors of success are as follows:

a) Involvement in the project of a majority of the internal actors: employees of the enterprise carrying out an environmental management action, or population groups concerned by a local action and

b) The construction of a genuine project with the partners in the given area or activity sector.

In effect, all environmental actions involve a variety of actors. Olivier Lagadec of ADEME points out, with regard to waste management, that: 'For many reasons the social actors are very much at the heart of waste management policy. Firstly because, in their capacity of producers and sorters of waste, the inhabitants are the first to be concerned by the changes of behaviour these policies require. These changes also affect the municipal technical operatives, the caretakers of apartment blocks in the collective habitat, who play a prime role in the success of, for example, selective collection policies. If this chain of actors is not taken into account upstream of the decisions, the risk of failure will increase.'

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(7) Law of 16 October 1997

Innovative actions call for the construction of new partnerships between these social actors. Company projects in the environmental field often involve networking within an occupational branch, with other activity sectors or in liaison with the public authorities. In France, for example, many company networks have come into being in particular employment sectors to study the management of industrial waste and apply common solutions.

Projects by local authorities all depend on close cooperation between local elected representatives, institutions and the representatives of the various public authorities, technical or administrative officers, experts, company managers, representatives of recruiting enterprises and consumer or environmental protection associations. The legislative and technical tools are in fact in place. All the innovative experience is now also in place thanks to the actors' ability to work in partnership and develop synergy between their skills. The ability of the elected representatives to cooperate at intercommunal level and to make the corresponding structures work is of prime importance. Furthermore, various actions assign an increasingly important role to the participation of the local population.

In the context of local/regional projects, new social actors have emerged: social economy enterprises, which are playing a growing part in the new environmental activities.

By their very nature, some projects involve an even a wider partnership. For example, the actions to improve the recycling of cars at the end of their useful life carried out by several States are based on cooperation between car manufacturers, the State, the business association of the garage trade and dismantlers and the crushing and recycling industries.

Actions to create new selective collection and recycling services for household waste must obey a social logic (recruitment of the unskilled unemployed) and an economic logic. A variety of research done on this subject has shown that the successful actions were based on partnership between local authorities, recruiting enterprises and the eco-industries.

3. The project managers' skills

Is there a typical profile for project leaders in the environmental field?

The various research projects we have carried out seem to suggest convergent trends among a wide variety of project leaders, such as technical officers, founders of enterprises, elected representatives, etc. The project manager, whatever his status, is the kingpin of the pilot action. He is responsible for setting up the project at local or company level by raising the awareness of all the actors involved and setting up a genuine partnership. He may be involved as from the design stage and take charge of or take part in establishing the action by mobilising a core of decision-makers. He is responsible for the coordination and follow-up of the action and may also plan and pursue various actions related to the environment.

In order to follow up these different stages, he needs skills in three main areas: communication, project organisation and management, the specific technical field of the action. The project leader must also be familiar with the sectoral or local context and the practices and actors involved. Occupational experience, as diverse as possible, is vital. Personality and leadership qualities are of prime importance.

This project manager function can be performed by individuals in various different jobs: company environmental officers; company production managers; technical service officers within a local authority; social entrepreneurs (representatives of an association, a recruiting enterprise, a social cooperative, etc.).

The job of environment-related project management may take up only part of this individual's working time and he may also have other duties to perform.

3.1. Transversal skills required for the design and implementation of environmental strategies

We have analysed the skills needed by *project managers* on the basis of the duties and activities connected with the design and management of environment-related projects.

The main duties involved in the various project managers' jobs do in fact have common features, linked to all the various steps and stages of a project.

J.P. Bellenger and J. Couhaert identify three key stages in a project:

a) the foundation of the project: this relates to the project backup on the basis of its purpose, its raison d'être (a project needs roots if it is to germinate and grow) and the objectives pursued;

b) the plan of action: this relates to the organisation of the necessary resources, the timing and the distribution of tasks and skills;

c) the operational plan: this relates to the management, follow-up and communication needed to overcome resistance, make the necessary adjustments and send out the appropriate messages.

These three key stages are followed by a final stocktaking stage (follow-up, control and readjustment).

The common features of activities linked to these various stages for a project related to the environment and employment are as follows.

Ad a):

- *carrying out a diagnostic analysis (audit of waste; state of a watercourse, etc.);*
- *collecting the necessary technical and regulatory information;*
- *summarising and analysing the information;*
- *updating the real costs (e.g., company waste management);*
- *identifying the applicable regulations;*
- *identifying the potential risks;*
- *selecting or designing a project and determining the objectives.*

Ad b):

- *drawing up a plan of action;*
- *fixing the priorities;*
- *identifying the advantages and disadvantages of a project;*
- *setting up a project;*
- *forming and organising a project team on the basis of the objectives fixed;*
- *providing for and seeking the necessary resources, taking account of the constraints and available resources: finance, manpower, material.*

Ad c):

- *managing the timing of the project;*
- *communication on the project;*
- *internal communication;*
- *external communication;*
- *planning the necessary training;*
- *follow-up and evaluation of a project;*
- *drawing up and implementing a management chart;*
- *determining the readjustments needed to overcome obstacles;*
- *evaluating the achievement of the objectives.*

In order to carry out these activities, it is clear that even in the case of very different projects, a pool of common skills is required, especially in the fields of project management, mediation, conduct and communication, organisation and management.

The project manager must plan the project strategy, incorporating in it the requirements of sustainable development and the training of the various actors. The transverse skills linked to the strategic and planning aspects, together with those linked to communication and raising public awareness, are also of capital importance. The 'capacity to resolve a problem in strategic terms' (La Rosa, 1996) is often cited as a vital skill, together with autonomy and creativity, as a means of making the socioeconomic system more competitive. In the same sense, environmental projects demand the capacity to take a global and systemic approach.

In order to carry out a diagnostic analysis prior to planning a project, the project leader must be able to retrieve and process complex information and be familiar with the corresponding technical field. For example, the technical officer in a local authority must be able to identify the various parameters and the impact of the technical and organisational options relating to waste management. To that end, he must be familiar with the area and the various organisational possibilities. This diagnostic task also calls for the capacity to perceive problems relating to the environment in global terms and in a systemic spirit and to apply a problem-analysis method. The project leader must also have the technical know-how to define the environmental indicators and draw up a management chart for following up these indicators.

In order to create new services or set up an action plan, the project leader must be able to design and apply technical and organisational solutions. For example, the collection and remanufacturing of office consumer goods (e.g. laser cartridges) is a growing activity, and many firms have been created in this sector. The management of these new firms must design means of collecting these consumer goods: in France, a partnership with a cleaning company has enabled one such firm to organise this collection. The management must also design and set up a remanufacturing production process and a system for disposing of the various types of waste. The project leader must therefore develop his creative and organisational abilities with a view to finding these new solutions. He must also be able to plan and coordinate the various stages of an action plan and to follow up and evaluate its execution and the achievement of the objectives.

Another important development in terms of the skills required concerns communication. The project leader must be able to convince and mobilise the various actors, to stimulate and raise their environmental awareness.

In fact, both workers and the general public always find it difficult to accept change. The project leader must be capable of explaining the actions and their implications, to listen to and take account of the demands of the workers and the people.

He must also be good at public relations so that he can negotiate and convince internal and external interlocutors at different levels of responsibility. He must have the necessary communication techniques to hold consultation meetings and draw up a communication plan. Without being a trainer, he must be capable of determining the training needs and draw up a training plan.

3.2. The skills of the project manager, a job-creation lever

Several case studies have shown that the creation of jobs related to environmental projects developed by local authorities depends on the skills of a technical officer or eco-advisor. Indeed, the skills described above are vital to the achievement of these job-creating projects in the framework of a territorial strategy.

Creation of a service to combat noise and recruitment of a noise technician; setting up selective collection centres and new forms of waste utilisation to create jobs in waste collection and sorting; mounting river maintenance operations and recruiting site foremen and maintenance officers; rehabilitating the natural heritage and industrial areas, maintenance and creation of sites in order to boost local business activity and create jobs.

Developing the skills of elected local and local authority representatives would make it possible to reduce this type of job-creating project.

At the same time, there is clearly a shortage of projects in some areas. Few of the innovative actions mentioned in the literature or observed during our own research concern the use of renewable energy or the modification of transport systems, for instance. Yet these are vital areas considering the major risks currently threatening the environment and the principles of managing the natural capital stock. Hypothetically, if the leaders of potential projects acquired new skills, innovative actions could be developed along these lines.

A case study quoted by the BIEF may illustrate this hypothesis. The study relates to drawing up business relocation plans in the Flemish community in Belgium. 'The object of this project is to reduce car traffic and promote combined transport and car-pooling, in cooperation with businesses, for journeys between home and the workplace.' These plans are designed and managed by 'mobility managers', under the responsibility of the mobility unit of the Ministry of Public Works, Transport and Regional Planning. Similar actions relating to transport modification could be developed at the initiative of competent project leaders, elected representatives or administrators.

Another example: expanding the use of photovoltaic solar energy today depends on the communication skills of those responsible for its development. As Gérard Valenduc explains, this technique is rarely applied in Europe mainly because of the 'conflictual power relations between actors in the energy sector, weak public policies, the extremely caricatured *green* image, problems with social acceptance, poorly chosen demonstration projects that fail, the poor strategy of the "spokesmen" for the innovations, etc.' (Valenduc, 1996). In fact the field of renewable energy offers good job-creation prospects: the Commission's Communication on environment and employment refers to the potential creation of half a million jobs in this sector.

Innovative projects also have an educational and demonstrative value, depending on the communication skills of the project leaders. It is assumed that if existing innovations were more widely known, that would also encourage job-creation.

3.3. Self-tuition and building up the project leader's skills

In most of the cases observed, the project leaders have wide professional experience. Their initial skills present no common features because their training and professional career may differ widely and their original diplomas or certificates had nothing to do with environmental matters.

The acquisition of the skills described above is the result of a wide variety of complementary initiatives and activities performed by the employee himself on a voluntary basis, such as work experience, seeking information from experts, the search for documentation, seminars and study visits.

The case study carried out by La Rosa on reducing the amount of packaging in an Italian cooperative reflects a period of self-tuition by the eco-manager of that business.

'The training that enables the eco-manager to coordinate the working group on packaging is *self-produced* and constantly evolving, thanks to his personal commitment to studying documents, especially those based on more advanced European experience in this field, his participation in special training courses and visits to study foreign markets and his cooperative relations with the packaging multinationals.' (La Rosa, 1996)

Several European States have set up training schemes to support environmental project managers within the enterprise, whether or not they are entirely responsible for environmental matters.

These training schemes are based on the following principles:

- modules phased over time to support the project leaders throughout the setting up of the project;
- education based on the exchange of good practice and resolving the problems encountered during the action;
- training objectives targeted at the practical capacity to carry out an environmental improvement action.

These training schemes are often accompanied by advice and technical assistance for each enterprise.

4. The dynamic of developing the skills of all the actors in relation to environmental projects

4.1. The commitment and responsibility of the various actors

Companies or local authorities that set up an environmental project need to improve the awareness and information of all the employees or actors involved and then to train them.

Two paragraphs of ISO Standard 14004 refer to the key role of management in enhancing the staff's awareness of environmental problems: 'securing the commitment of all staff to environmental policy, understanding and sharing the company's objectives and targets, creating a sense of individual responsibility'.

The European EMAS standard calls for an in-service training system for employees in the field of environmental management, depending on their position within the company.

In a company conducting an environment-related project, this action can be successful only if each employee becomes aware of the impact his everyday behaviour has on the environment and of the implications for the company's performance. Indeed, the staff perform certain occupational actions every day, in connection with sorting waste, disposing of effluents, using water, and so forth. Any attempt by management or the environmental officer to modify these actions is regarded as a hierarchical constraint. So it is vital to link the improvement of these actions to certain potential benefits.

The studies carried out for Cedefop in the United Kingdom and in France show that the companies that have set up an environmental management system have also introduced awareness-raising training schemes for all their staff, including directors and managers.

For local authorities, the design and setting up of environmental projects also implies informing, raising awareness and training the various actors involved: elected representatives, technical and administrative officers, operators and technicians.

It is also most important to raise the awareness of the general public. For it is the everyday behaviour of each individual in sorting waste or using water that will enable this kind of action to succeed. The same level of responsibility and the same requirements apply here as for company employees.

That is why local authority environmental actions increasingly incorporate the aspects of communication and environmental education.

4.2. New occupational opportunities for low-skilled job seekers

Environmental projects offer poorly qualified job-seekers new occupational opportunities. Sometimes, these jobs require few qualifications and merely represent a stage in the working life of the unemployed and a springboard towards another job. This applies to some jobs on waste-sorting assembly lines. Often, however, they are genuine jobs involving new tasks and requiring technical and transverse skills. This is true, for example, of the AMI-TRI jobs created by the town of Chambéry in France in order to improve the quality of selective collection by actions to raise the awareness of the local people. These new jobs, open to individuals who have taken part in work integration schemes, can raise the awareness of the inhabitants of difficult sectors through door-to-door and direct contact. The same kind of job is found in Denmark: *green* employees ensure a skilled approach is taken to situations that have an important impact on the local environment (Faergemann, 1996).

We want to emphasise a vital component of most of the projects observed: a large number of jobs created are at qualification levels 1 and 2. They include, for example, jobs in landscape maintenance, water treatment, maintaining the natural heritage, waste treatment, waste sorting and recycling, guarding waste collection sites, municipal cleaning, solid and liquid waste collection.

4.3. Development of the role and methods of training in relation to building up skills

The training schemes set up to respond to the new requirements described above can also form part of a project. These training schemes, where they exist, are an integral part of the project rather than an external service or merely an instrument to regulate human resources. In the case of innovative projects, standardised training schemes cannot respond to the requirements. Training therefore becomes a component of the project, in the same way as advice, communication or the technical study of an environmental diagnosis. It aims to achieve the same general objectives as the global project; these can be divided up into educational objectives, technical objectives, etc.

The training is often targeted at all the actors involved rather than at a specific group of people. In France, for example, the training aspect of an innovative project on river improvement and maintenance involved elected representatives, management and workers. So this training is directed at all the actors involved: the elected representatives of the group of local authorities conducting the project, the river maintenance officer in the local authority and also the employees of public works undertakings, associations and recruiting enterprises operating in the field of watercourse improvement. The financing method reflects the fact that the training is an integral part of the project because it is financed by the institutions involved in the improvement of the watercourses (Agences de l'Eau, Conseil Général), rather than by the usual financiers of in-service training.

Training needs involve more than simply the acquisition of knowledge and technical know-how. For example, it is most important for company employees carrying out an environmental action to modify their everyday behaviour. The training is designed to enable these employees to engage in a collective reflection about the potential benefits of the action and its environmental impact and to become more aware of their responsibilities.

The awareness-raising training schemes we have observed are designed specifically for the enterprise concerned and pursue the following objectives:

- raising awareness of global environmental problems and of the role of each individual, citizen, enterprise, local authority or State, in resolving these problems;
- understanding the potential benefits for the enterprise of greater respect for the environment: risk prevention, public health, compliance with regulations, protection of the natural environment, cost reduction, improvement of the company image, competitiveness;
- discovering the environmental impact of the enterprise on resources, the natural environment, the local population, the staff: consumption of energy, water and raw materials, air pollution, waste, sludge, waste water, noise, odours, etc.;
- understanding the origin of these impacts: processes, methods, products, material, personal and collective behaviour, etc.;
- understanding and implementing preventive and curative measures:
- establishing a dynamic of change;
- carrying out actions related to setting up environmental management systems where appropriate.

The environment is approached in a global, systemic fashion, establishing the relationship between four aspects: water, air, the natural environment and waste. The impact of this kind of training goes even further than teaching the employees new forms of behaviour: it leads each individual to become more aware of his responsibilities as a citizen able to incorporate an environmental reflex in his everyday behaviour. This kind of training therefore pursues the same objectives as the environmental education actions aimed mainly at children and young people at school during their leisure activities.

5. Conclusions

The acquisition of the skills described above by project managers and by all the actors concerned is decisive to the successful setting-up of innovative actions relating to employment and the environment.

Many of the required skills are transversal: the project managers must be able to plan a project strategy which incorporates sustainable development requirements and the training of the actors involved; the employees and citizens must learn new forms of behaviour in their everyday activities. Today, these skills are acquired and developed partly by self-tuition, partly by training schemes integrated in the project. At present, the acquisition and recognition of skills linked to 'environmental project management' are either not developed or poorly developed. Innovative job-creation actions can be supported by the reduction of projects incorporating a training-scheme component among a very disparate public: technical officers and engineers in local authorities; company engineers, production managers and environmental officers; advisors who provide assistance and advice to SMI-SMEs (8); company employees; elected representatives; representatives of associations.

The main trends we have observed in relation to innovative employment and environment-related actions reflect more general developments. These environment-related actions form part of a dynamic of developing local employment initiatives, based on the emergence of new social actors such as social economy enterprises, the building of new partnerships and the establishment of regional/local projects incorporating a variety of aspects (environment, employment, democracy, urban networks, etc.). Moreover, as we have seen, they form part of project initiatives whose success depends on the contributions and skills of the project leaders and on the capacities of all concerned, employees and citizens. This trend has major implications for the skills required and for training needs. Indeed, the technical qualification of a particular category of employees is less important now than the acquisition of transverse skills and setting up integrated training schemes within projects aimed at actors at a wide variety of levels and with very different skills.

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(8) SMI: small and medium-sized industries, SME: small and medium-sized enterprises.

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D. The local and regional dimension: qualifications and skills needs analysis as a basis of VET planning [1]

Mario Gatti, Claudio Tagliaferro, Maria Grazia Mereu [2]

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Summary and outlook

This article is based on surveys carried out in Modena and Vienna as part of the Ciretoq (Circle for Research Co-operation in Europe on Trends in Occupations and Qualifications) programme. The qualifications and skills required in the engineering sector were analysed. In this report, ISFOL (Istituto per lo Sviluppo della Formazione professionale dei Lavoratori – Institute for the improvement of vocational training for workers) considers the policy implications of needs analysis with a view to planning effective and appropriate training to promote the development of the local socioeconomic system as a whole. Particular attention is paid to the main strategies used to analyse requirements for the purposes of planning, briefly outlining the Italian experience in this area. A description is provided of the methods used to analyse the needs in the two national surveys which were compared. Details are then given of the main findings of the two surveys and in particular the trends with regard to the development of skills in the engineering sector. The article concludes with a series of ideas which serve as the basis for a number of recommendations to decision-makers concerned with proactive labour and training programme policies and to those responsible for training schemes, calling on them to create and implement an integrated and coordinated system for socioeconomic development in their geographical areas.

Introduction

Over the past few decades, the socioeconomic scenario has been characterised by a number of problems common to all highly-industrialised countries. New technologies have compelled radical changes to production patterns and a rethink of organisational and market logic. Concepts such as the information society, the globalisation of markets, the development of human resources and continuous lifelong training have insinuated themselves into the everyday language of development policies for the world economies. The ferment engendered by these ideas affects everyone and no-one can claim to be unaware of the challenge presented by trying to ensure economic growth of benefit to the community. This development, which is taking place across Europe, has also had far-reaching effects on the social fabric, resulting in alarming levels of unemployment. Unemployment is on a dramatic scale in Italy, particularly in the south where the historical backwardness of that part of the country offers no prospect of early solutions. Young people who have 'grown old' in looking for a job cannot break into the productive circuit and feel that they are condemned to remain in limbo, with survival boiling down to the Italian art of shifting for oneself.

In addition to youth unemployment or, more correctly, young out of work, considerable numbers of workers have been thrown out of the labour market as a result of the decline of industry or because of their own unsuitability for the new corporate organisation. For a factory which takes on ever more sophisticated machinery and introduces increasingly flexible forms of organisation, the human element is vital in determining whether continuous changes can be introduced, and the key would appear to be linked, more and more, to the quality of training provided to the workforce. Both the public authorities and employers have understood the strategic importance of training human resources in successfully meet the challenges set by the new patterns of the world economy and are promoting initiatives and action aimed at improving workers' skills.

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[1] Contribution to the Ciretoq handbook 'European trends in occupations and qualifications'.

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1. Methods for needs analysis in support the planning of training

Central to action to promote the development of human resources is the analysis/anticipation of professional requirements in order to be able to implement targeted training policies. An understanding of occupational and training requirements is the key to ensuring that the needs arising from changes to the economic system are reflected in adjustments to the training system. However, recent history shows that the two systems concerned have developed separately and independently in Italy and have produced and consolidated widely differing practices and languages. Nevertheless, the authorities and the social partners have come to a clearer appreciation of the important strategic role played by needs analysis/anticipation in the training policy formulation process, and that it is an essential condition, if not a prerequisite, for the continuous adjustment of training to meet the express needs of the socioeconomic system. A strong push in this direction has been given by the latest action strategies promoted at EU level through the European Social Fund, which looks on needs analysis/anticipation as a form of action cutting across the various lines of planned intervention. Whereas past planning for training had serious shortcomings as regards needs evaluation and analysis, the latest objective-based planning lays stress on both aspects and places them at the centre of the whole planning process, not just as regards vocational training but also economic and occupational development and the formulation of proactive labour policies.

Over the past few years, ISFOL (Istituto per lo Sviluppo della Formazione professionale dei Lavoratori – Institute for the improvement of vocational training for workers) has given a great deal of thought to the complex issue of needs analysis, and the outcome has been an initial series of local and sectoral experiments. Needs analysis, in the widest sense, is the stage in the training and employment policy formulation process which is devoted to recording and analysing occupational and training needs in a given geographical area, sector and/or company; it is the key to linking training schemes and the productive system and, through planning, can make an ongoing contribution to the update of training on offer. In Italy, significant new legislation on the subject of employment and training policies has, over the past five years, established an institutional role for needs analysis in defining the relationship between training and the world of work and employment. In this context, the new role of social partners, who have become leading players in consultation and dialogue with the authorities, has come to the fore. The main experiments in needs analysis/anticipation at national level stem from agreements between by the Ministry of Labour and the bipartite bodies (³) under the terms of the legislation and declarations of intent. These experiments are highly significant since they provide an initial concrete reference point for initiating a process ultimately aimed at the creation of 'a permanent national observatory for identifying requirements' involving consultation and dialogue with, and the participation of, the social partners. The most important of the initiatives currently under way are three projects involving the bipartite bodies for industry and the arts and crafts sector and the association of Chambers of Commerce and Industry. ISFOL has a remit from the Ministry of Labour to provide technical assistance and to monitor and evaluate the action taken.

While some progress has now been achieved with needs analysis, the experience accrued

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(³) Joint representative bodies of employers and trade unions.

by ISFOL from the observations and surveys of the past few years shows that the relationship between analysis, planning and provision of training has, in recent years, been far from linear, and intrinsically weak. This stems from the overlap of areas of competence, doubts about the instruments used, poor focusing of analysis aims and a lack of clarity about the user/commissioning body of the programming process and/or the planning of training activity and, last but not least, because this type of initiative is often episodic. It should, however, be noted that we are looking at a fairly new issue, since almost all experience with needs analysis at local level has been concentrated in the past 10 years, whilst experience at national level dates back only a couple of years. Local authorities are now showing greater interest in formulating training policies which meet the express needs of the area concerned.

The ideas discussed by ISFOL in recent years have allowed it to formulate and try out a number of technical and procedural indicators which have contributed to the significant success of needs analysis in support of planning. We shall now summarise the salient features of ISFOL's methodological rationale. Any needs analysis aimed at the formulation of strategy must be founded on a four-stage data collection process:

- analysis of demand for labour and training;
- analysis of the training on offer;
- analysis of potential use;
- analysis of the results of training activity.

Secondly, for an accurate and effective needs analysis methodology a number of basic requirements must be identified:

- who commissions/uses the survey;
- why, or a definition of the question to be answered;
- what to investigate in the light of information needs;
- how to investigate, that is to say, the most suitable methodological approach for conducting the survey.

On the basis of these, a seven-point working method can be established:

1. identification of the principal commissioning body and user of the survey;
2. definition of the information needs;
3. choice of the type of survey appropriate to the information needs;
4. choice of methods and instruments appropriate to the type of survey;
5. the way in which the survey should be conducted;
6. assessment and validation of the findings;
7. use of the results.

The interest recently shown by the social partners and the authorities in this matter and their active involvement are extending the use of, and attracting more widespread attention in Italy to, these types of surveys, concepts and investigative instruments. However, while we can claim that some progress has been made with analysing needs aimed at the formulation of strategy, other areas are still lagging behind. In particular, surveys of companies reveal that businesses have some difficulty in understanding their own needs and in identifying future requirements. Companies should therefore be provided with methodological instruments allowing them to analyse their needs for themselves and involving them in each stage of the analysis. Furthermore, it is preferable, in this context, that the needs analysis be carried out at sectoral and geographical level.

This has been the logic behind ISFOL's work on needs analysis. The most recent project is the survey conducted in conjunction with the local authorities on the engineering sector in Modena. The survey of engineering firms in Modena formed part of the initiatives promoted by Cedefop through the Ciretoq network of institutes, and was carried out in partnership with the Viennese institute IWI (Industriewissenschaftliches Institut an der Wirtschaftsuniversität Wien), which conducted a similar survey in Vienna.

Ciretoq (Circle for Research Co-operation in Europe on Trends in Occupations and Qualifications) is of course a network set up by Cedefop to provide additional support for European Union vocational training programmes, fostering cooperation between European research institutes and universities on specific subjects areas. The network is intended to follow up the work done by Cedefop in observing, presenting and comparing research in Europe on qualification schemes, on the demand for qualifications, on changes in job profiles consequent on technical and organisational developments. Ciretoq also promotes transnational experimentation.

In the context of a series of socioeconomic surveys planned by Ciretoq, ISFOL and its Austrian partner IWI submitted a proposal for two coordinated area-specific surveys aimed at analysing job profile requirements in the engineering sector. In particular, ISFOL suggested that the working method for needs surveys be tested in the two community contexts.

Because this working method would not impose any specific pre-set methodology, the idea was taken up with interest by the Austrian partner. In fact, while allowing for the differences between the two local contexts selected and the different grounds for the two surveys, parallel objectives were identified and pursued in the two reference areas. The Vienna research was directed towards studying transverse changes in job profiles in terms of access and knowledge/skills requirements in the engineering sector, for the purposes of updating and adjusting the qualifications offered by the national education and vocational training system to the new needs of the labour market. For its part, ISFOL assisted the Commune of Modena in its endeavour to combine the express needs of the labour market, in terms of identifying job profiles and skills, and the needs of the regional vocational training system, in terms of training to meet market demand. As regards the points cited for the proposed needs analysis working method, the main user of the survey results is, in both cases, an authority; for Vienna, the education/training system and for Modena, the policy-makers responsible for managing the labour market and training programmes.

Despite differences in the approaches taken for the national surveys, ISFOL and IWI tried to optimise their work by conducting their research in parallel and keeping a record of the time spent on the two surveys. The parallel action was divided basically into three stages: the first, preparatory, stage involved identifying job profile trends in the sector, the second concentrated on collecting data and information on professional skills in the engineering sector; the third, and final, phase involves discussion and validation by focus groups of the findings of the earlier stages. Despite the difference between the local surveys, a plan was worked out for coordinating the stages, timing of the work and points for exchange and interaction between the two working groups.

The findings of the two surveys are being published by Cedefop in the form of comparative summaries. The full results can be obtained from Cedefop. We confine ourselves here to commenting on the principal trends highlighted by the two national surveys.

The contexts and patterns of production in Vienna and Modena have different features peculiar to each. Viennese industry is characterised by delocalisation of production sites and a practice of outsourcing which are used as strategies to cope with the serious crisis which has hit the sector and has led to a shift in production towards globalisation. In its turn, the industrial zone developed in the Modena area is characterised by the presence of small and medium-sized firms which work together closely in a kind of ‘virtual’ enterprise, in a context of far-reaching sectoral change involving the vigorous development of new technologies, far greater flexibility in the organisation of firms and the creation of a network of engineering firms.

The demand for qualifications also varies between Austria and Italy; this has nothing to do with differences in the approach of the two national surveys but is due to the different ways in which the two productive contexts have developed. However, analysis of the results makes it possible to identify three areas of convergence: the characteristics of the engineering sector on the ground, the main job trends and the changes in skills.

In both cases, the specific nature of the two patterns of production in the engineering industry has led to job losses, particularly in Vienna, together with significant changes in job profiles and therefore to greater demand for qualifications. In fact, irrespective of the wide divergence between the two areas of production, engineering industries in both Modena and Vienna are in a state of transition where, despite differing features, technical and specialist skills and abilities are merging with strategic managerial skills and abilities.

Parallel scrutiny of the trends in both countries reveals analogous needs in respect of workers' professional skills and abilities in the engineering industries which, over and above the specific features of the two productive contexts, are facing the same challenge: how to cope with the problem of lack of job security resulting from the growing internationalisation of industry and the consequent corporate restructuring.

The current labour market in both Modena and Vienna must to be able to count on a labour force characterised by greater flexibility, able to handle crises, take on more responsibility and have greater involvement in the production process and with higher technical and specialist qualifications. This reflects therefore an analogous need for workers with better basic qualifications and extensive specialist knowledge who are at the same time capable of developing lateral skills enabling them to improve communication and personal relationships both within companies and with clients.

In the case of skills, while no detailed analytical comparison is possible, there are analogies between the job skills required of workers in Vienna and in Modena. Broadly speaking, we can say that, as compared with the past, performance-related skills observed in the two countries call for increased general knowledge, together with detailed technical knowledge and an understanding of the process/product, which open the way to job rotation within a work structure geared to projects and team work. The new organisational structures which are gaining ground in both the scenarios studied, require all corporate staff to develop social skills reflecting an ability to communicate and to work others both inside and outside the firm. This new production context therefore requires people with personal skills which enable them to work independently within groups and with a considerable ability to analyse and abstract, which, combined with flexibility, enables them to establish complex and detailed assessments in dealing with crises.

2. Job skill trends in the engineering sector

The survey identified three types of needs analysis for three closely related aspects. The first, which can be defined as analysis of technological needs, aims to identify the ways in which businesses analyse and handle technological innovation problems and the approach they adopt. The purpose of this type of survey is not only to establish how far new technologies have been introduced into the structure of production but, more importantly, to identify the most appropriate action for communicating information, increasing awareness and providing training with a view to optimising the benefits provided by the technological change, in terms of the effectiveness and efficiency of production. The second type of analysis looks at the specific professional skills and job profiles required by firms and by the productive context. These two types of analysis are a prerequisite and the basis for the third type of analysis relating to vocational training needs.

The purpose of the surveys carried out in Vienna and Modena was to identify trends in the engineering sector, starting from the hypothesis that the need stemmed from various factors linked to new production technologies, organisational changes and the diversification and expansion of markets. The scope and purpose of the research suggested the adoption of methods enabling detailed data to be collected on the content of job profiles for which there was a certain level of need.

In recent years, businesses in Modena and Vienna have shown a clear awareness of the problems of technological innovation and have managed to stay competitive by concentrating their investments in this area in order to keep up with competitors operating in the same sector in both Italy and elsewhere. This process has involved parallel organisational and skill changes. This has therefore called for the provision of ongoing training aimed at developing job profiles which meet the need for solutions to be provided which cover the firm's internal and external needs.

Despite the crisis which hit the sector, the economies of Modena and Vienna were able to rely on a number of strengths, attributable to the powerful drive towards innovation and flexible organisation. This has impacted on jobs in the engineering sector by requiring firstly a fresh strategic approach, and secondly changes to the range of technological skills with particular emphasis on the quality of processes and products.

This historic period being lived through by engineering firms is one of transition in which technical and specialist skills and abilities, which have always been the strength of workforces in local firms, must evolve and be combined with strategic/managerial types of skills and abilities. This period of transition involves various facets of the socio-productive fabric and creates a need for skills and abilities linked to the structural problems affecting the socio-productive environment in its current phase of transition, which reflects a need for diversified occupational skills and job profiles.

- **Job profiles for the management of innovative functions** and providing a workforce capable of establishing strategies to support this function; able to plan lines of action and manage relations between operators in this area; capable of monitoring results and improving action plans.

- **Job profiles for managing integrated processes** providing a workforce capable of combining the core skills required for their 'typical contribution' with the professional 'know-how' required to maintain effective dialogue with upstream and downstream functions of the process.

- **Job profiles reflecting an ability to diagnose and solve problems.**

- **Multifunctional job profiles.** The move towards multifunctional tasking involves a process which adds greatly to the complexity of the job descriptions which delimit workers' roles in the production structure; in each case, job skills are added to satisfy the needs of technology and the market. This requires a workforce with advanced technical skills, willing to up-date and able to turn know-how gained from experience to best advantage.

- **Job profiles reflecting technical and specialist know-how.** These jobs involve the implementation and monitoring of procedures strictly related to a single part of the process.

To summarise, the main trends which emerged in respect of required job skills and abilities reflect the need to be flexible, to be able to handle crises, to take on greater responsibility, to become more involved in the production process and, last but not least, the importance of improving technical and specialist qualifications. These are the new requirements imposed by the labour market which must be met by workers in Modena and Vienna if they are to master and maintain their jobs.

There were a number of indications in the course of the survey suggesting that the situation should not be regarded as static but should be interpreted dynamically. The geographical areas analysed are indeed in a state of transition involving all productive structures in the sectors analysed. Even historically product-oriented firms are shifting towards a type of management and planning strategy which enables them to take on the market and its critical situations.

The trends highlighted earlier can therefore be summarised as follows: skills relating to the ability to manage production must be maintained and extended, but they must also at the same time be enhanced by strategic and management abilities and must be backed by system skills which will ensure, within the firm, the optimisation of the processes and customer satisfaction.

3. Recommendations to policy-makers on the planning of training

With the continuous changes affecting the whole enterprise sector, human resources have become the key factor, but the economy also requires new types of job profiles capable of developing their own content to match the changes in organisation and productivity. This calls for the adoption of new attitudes towards work and the possession of the right educational and personal attributes, to which vocational training can make a decisive contribution. Side by side with this, we have a paradox in that firms cannot find the skilled workers they need, even in a well-supplied labour market with high levels of unemployment among young school-leavers and substantial long-term unemployment.

These factors explain the growing interest in initiatives such as needs analysis/anticipation, which can produce a more balanced relationship between training demand and supply. It is no coincidence that greater human and financial resources are being devoted to studying needs arising at local and national level. It must be asked, however, why, after so many years of endeavour and experimentation, the question of needs anticipation/analysis has not yet been resolved. There are many reasons for this. First and foremost, needs identification is not a survey method but a series of activities with the same general objective of gathering information about needs but which differ, in particular as regards the geographical scope, remit, specific objectives, methodology/means used and use of the results. There are therefore many ideas on the subject, various culturally-conditioned approaches and a number of instruments for undertaking needs identification. The result is an wide variety of very different forms of action which are often difficult to compare. In addition, there are difficulties of a conceptual nature both with regard to the scope of surveys and with regard to the definition of categories covered by the research and identification of the subjects to be analysed. The procedure used by ISFOL and IWI for the engineering sector has produced positive results far exceeding those of earlier experiments, but no solution is in sight for resolving the problems of needs anticipation/analysis, so that the range of experiments at Community, national and local level must be further widened in the hope of achieving the critical mass which will provide the answers to the outstanding issues.

The survey results provide a part of the picture, since they are based on the views and expectations of people involved in the day-to-day problems of production and productivity. Government policy makers and the social partners involved in formulating strategic plans for managing the labour market and for training should take stock of other existing or emerging variables in the social and productive fabric of the area concerned, and in particular of all the factors which help to bring about social and cultural change, such as population balance and flows, changes in attitudes of both young people and adults to work and problems connected with the generation gap. Policy-makers should also take account of the constraints and opportunities of the global market which influence decisions as regards exploiting a geographical area to the best advantage, in terms of planning of broad strategies with a view to encompassing all sectors of production.

Within this scenario, the perception and opinion of those in the engineering sector as regards future job patterns clearly represent just one viewpoint, limited to the confines of their picture of the industry model which is conditioned by their own observations.

In our view, this is a vital model, which must be taken as a key point of reference. It denotes, in fact, the degree of awareness which is developing in firms in the sector when making choices about corporate strategy or ways of using human resources to best advantage. The effectiveness of any form of action aimed at developing a geographical area and the structure of employment in that location will be in proportion to the extent to which account is taken of the characteristics of corporate culture in the actual workplaces.

The points covered by this report provide the immediate basis for two kinds of suggestions and/or recommendations to the various authorities responsible for the formulation of proactive employment and vocational training policies. Programmes targeting local requirements must be developed, in the light of the findings of the needs analysis/anticipation surveys carried out in the reference industries.

Nevertheless, while there has been a greater realisation in recent years of the strategic value of sound needs analysis for the social and economic development of a geographical area, this is still only episodic, whereas there is an obvious need for regular action of this kind, backed by adequate and ongoing assessment, enabling needs surveys to be refined and improved by successive approximations. The ideal would be to construct a system to monitor at national level changes in job profiles and skills and in indicators, which would then be supplemented by more detailed analyses at local level.

In the light of the results of continuous monitoring of changes in the know-how and abilities demanded of workers, the curricula for vocational training plans will have to be updated, consolidated and modified. These plans will have to be rethought from the standpoint of educating for change and continuous learning. Changes to the training system should include the action promoted by recent Italian legislation in response to the need to provide systematic training opportunities and skills recognition, to open the way to individualised careers over the whole of active working life.

We conclude by very briefly summarising what might be set out as guidelines for action by policy-makers and those responsible for the training system.

Policy-makers should:
- promote an understanding of the value of needs analysis/anticipation, so that this type of survey becomes standard practice;
- act to refine methods by successive approximations based on experiment and the assessment of results;
- act in consultation with the social partners.

The **training system** should:
- increase receptiveness towards inputs from the economy;
- make training structures more flexible so that they can respond more quickly to the needs of a geographical areas and ensure that steps are taken to modernise the service;
- take account of the points made in this report about current job trends.

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II. Development of supply and demand in initial VET in colleges and companies

Chapter II deals with issues relating to the **development of the supply of and demand for qualifications and skills, particularly with regard to initial education and training.** This chapter contains five articles. Its central theme is whether, and to what extent, skills and training can give people better or worse prospects of getting a job, which levels of education are preferable and which levels of training provide the best opportunities, and in which fields they are likely to be of use.

It examines the impact of modern information and communications technologies (ICTs) on these questions, and the changes in the occupational and work requirements they bring about through the reorganisation of work and new divisions of labour. Was there a risk that specific groups of people or levels of education would be driven out of the workforce by people with higher skills, and did this point to a trend in the polarisation of skills, with highly-skilled workers at one end of the scale and low-skilled workers at the other? The chapter finally examines ways of restructuring training certificates, degrees and diplomas: which institutional instruments could be used and what time-span could be envisaged for these qualifications to be adapted to the new requirements and conditions.

Hilary Steedman reports on the findings of a research project commissioned by the European Commission's Directorate-General on Science, Research and Development (DG XII) **on low-skilled workers**. This research was carried out in a number of Member States and deals with various aspects: the rising wage differentials between the low-skilled and the higher-skilled, a comparison of their job prospects and trends in participation in, and access to, education and training. In all the countries participating in the project, there had been a rapid deterioration in job prospects for the low-skilled in recent years, while the provision of training and further training had not been developed to meet the need for higher-skilled workers. Technological change was the main cause of this fall in demand for low-skilled labour, and the expanding sectors were those where employees typically had higher level skills.

The next question, namely how can we reduce the number of people in low-skilled employment, was answered as follows: steps had to be taken to increase substantially the number of people continuing their education once they had completed compulsory schooling, i.e. those staying on at secondary school, attending vocational and technical colleges or going on to universities. Short-term measures aimed at early school-leavers, such as work-related youth training and employment schemes seemed, however, to have little effect. These schemes did not necessarily motivate young people to undertake recognised further education or training courses, but tied them down to relatively low-skilled jobs, which might not even lead to stable employment. The excessively high proportion of youth unemployment in most of the countries could scarcely be resolved through such measures. In addition, it also became apparent as the project got under way that fewer workers with lower levels of initial education took part in work-related training or further training. This was not because of a lack of training places in training centres and companies, but because most of these young people seemed to have no interest (or no further interest) in taking part in long-term training courses.

Lex Borghans and Andries de Grip have examined the polarisation of skills, i.e. **the relationship between the higher-skilled and the low-skilled**, from predominantly macroeconomic perspectives, and on the basis of relevant statistics. The bumping-down of the low-skilled by the higher-skilled and the over-supply of higher educated workers is discussed. Were the latter occupying jobs commensurate with their training? And, if, so, how did this affect the job opportunities of the low-skilled? Among other subjects, job competition is compared with wage competition among the low-skilled and higher-skilled. Attempts are made to answer the question of whether or not additional investments in schooling are 'worthwhile'. In obvious cases of bumping down, additional investments in education were not very effective, but, if new fields of activity opened up, the increased productivity of the more highly educated might make more educational investments fruitful. The authors' research suggests that the effects of training might also lead to new employment opportunities, indeed that a good supply of highly-skilled workers might even be a prerequisite for such opportunities.

Moreover, the research revealed that higher skills only paid off under certain conditions for, if higher-skilled workers only took over the jobs of low-skilled workers, their wages would fall. Only where changes in work organisation went hand in hand with the development of new and better products and services, including new fields of activity, could higher skilled workers expect to receive higher wages. However, regardless of whether the replacement process involved a retrograde move (bumping down) or calls for generally higher skills (upgrading), the low-skilled worker was the loser in each and every case.

Lázaro González, presents the findings of a study commissioned by Cedefop, carried out in three Member States, on **the impact of new information and communications technologies (ICTs) on the development of vocational skills and training needs**, concluding with the new challenges facing education and training. These would radically change the job and career patterns of individuals, and methods of work organisation within companies. Enterprise culture had to be changed, as well as the form and content of education and training. Transversal and multi-skilled work teams would be set up in the place of hierarchical or subject-oriented structures. Individual and personal skills, together with social skills, would be vital for work in the information society: creativity and initiative, continuing training, the ability to be aware of the consequences of one's actions, the ability to work in a team, etc. would become more important in the future.

The new technologies of the information society of the future would, moreover, require general basic skills, that should already have been learnt during initial education.

Werner Dostal also stresses the need to increase the provision of education and training in his article on the subject of computer technology itself. He found a high demand for **computer-related and multi-media skills**, which training schemes and training capacities could scarcely meet.

Employment structures for occupations in the field of information technology and communications technology revealed different types of computer occupation, e.g. core activity, mixed-skills activity and marginal activity. Core activity, or 'pure' information technology occupations were in high demand, but there was also a large number of people working in this area who had come in through the back door, so to speak, and who, because they had been working in a related area, had taught themselves the job and acquired additional skills. Whether these relatively low-skilled workers would be able to continue working in the narrower sphere of information technology in the future, or whether, as the author suspected, they would be pushed back into a more general or marginal area, remained to be seen. That would depend, among other things, upon whether it would be possible to plan and regularise this area of activity, or whether activities that were rather abstract and difficult to regulate would remain to the fore in the future.

In any case, the present and foreseeable future labour market prospects for these occupations was very favourable. On the subject of training, the author calls for the expansion of further and higher vocational education, saying that on-the-job training, such as that provided under the dual system, is inadequate in the medium term. The increasing use of multimedia technology and the Internet, etc. had, moreover, led to the creation of new, more flexible forms of working, such as teleworking, which might replace the traditional structures and patterns of industry. A core team would still remain, but only to a limited extent.

Martine Möbus und Eric Verdier report on a **comparative study on the structuring and regulation of occupational profiles** and rules, and certification **in France and Germany**. They examined in particular the institutional environment and the coordination measures being taken, and the impact they had on new rules and regulations on vocational qualifications in the two countries. The ongoing processes and their results would not only shape the supply of education, but would, moreover, influence the structuring of the labour market and the industrial relations of both countries in general. The main question behind this study was whether, and to what extent, the processes being used were adjusting to the social and economic challenges, and whether they were in a position to stand up to the rapid changes they brought in their wake.

Could formally defined and officially sanctioned vocational qualifications and skills still provide points of reference in these times of rapid change in labour and production? What impact did they have on trends at sectoral and interprofessional level, and at corporate level? What were these regulations like, were they general regulations, or did they lay down detailed rules? Were they mainly market-oriented regulations such as those prevailing in the Anglo-Saxon countries, or regulations laid down by the supreme authority of the public authorities, as in France, and were the social partners actively involved in the process, as in Germany? The cultural and traditional differences clearly stood out, enabling conclusions to be drawn for the future development of institutional coordination systems in each of the countries concerned. In any case, it was felt that the involvement of the social partners would play a key role in these matters.

A. Low skills – how the supply is changing across Europe

Hilary Steedman (¹)

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Summary and outlook

This chapter sets out the findings and results from a research programme entitled 'New job-skill needs and the low-skilled', which examines the position of the low-skilled in six European countries; France, Germany, the Netherlands, Portugal, Sweden, and the UK.

The declining position of the low-skilled is evidenced by rising wage differentials between the low-skilled and the higher-skilled, and increasing unemployment amongst individuals with low skills. Given that the numbers classified as low-skilled are simultaneously falling, these changes suggest a declining demand for low-skilled labour. A research topic analysing the demand for labour at different skill levels, so far carried out only for Sweden, suggests that technological change in favour of those at higher levels is the main cause of this fall in demand for low-skilled labour. An analysis of the sectors where new jobs are being created shows that the expanding sectors are where employees typically have higher level skills. Low-skilled individuals are to be found in sectors that are in decline, or not growing particularly fast, in which they are being increasingly concentrated, particularly in Germany. An analysis of inactivity further shows that low-skilled individuals are much more likely to be inactive in all of our countries except Portugal. The result is that the low-skilled have much lower employment/population ratios and much higher unemployment rates than those further up the skills spectrum. For those in employment, however, an analysis of new job/hire quality reveals that new job quality is not declining for any particular skill group relative to others, with the exception of the UK, where the low-skilled are increasingly disadvantaged in terms of real wage rates and involuntary part-time employment rates.

An important aspect of this project, to enable such comparative results to be derived, is to determine a consistent definition of what constitutes low skills. A number of our research topics have arrived at the conclusion that the ISCED classification scheme should be used for this purpose, and that the low-skilled should be defined as those at level 2 or below. It was decided to use the ISCED scheme, as all of our countries conduct annual or biennial surveys that contain information on qualifications held, that can be related to the other labour market data on individuals in those surveys.

(¹) Centre for Economic Performance, London School of Economics and Political Science. The author acknowledges the very important contributions made to this chapter by members of the Newskills group (see below).

Further, stages of education completed and certificates of achievement are frequently used by employers and potential employees in the labour market as indicators of ability. The particular cut-off point was chosen to leave a significant number classified as low-skilled. A comparison with data from the International Adult Literacy Survey (IALS) reveals that similar proportions of the working age population are below ISCED 3 and also classified as low-skilled in IALS (levels 1 or 2) in each of our countries. Further, most very low-skilled individuals in IALS (level 1) are found to be below ISCED 3. An investigation into the numbers classified as low-skilled reveals that these vary across the six countries. Considering changes over time, these proportions are shown to be falling most quickly where they are initially higher (with the exception of Portugal). However, only in Germany and Sweden will the problem of the low-skilled have become of minor importance by 2010.

How, then, can the numbers with only low skills be reduced? Experience suggests that the primary route is to get more young people into upper secondary education or vocational training. An analysis of the determinants of participation in post-compulsory education shows that the key explanatory variable is prior academic success, plus, for males, the returns available to offering a higher level of education, and the level of real income available to spend on education. The level of youth unemployment and the availability of training scheme places seem to have little effect. Examining work-related training, our study shows that firms contribute towards the costs of general training. Disentangling the demand for, and supply of, training places suggests that workers with lower levels of initial education receive less work-related training because they are less interested in taking it, and not because firms are less likely to offer it.

1. Introduction

This contribution sets out the results of two years work by a group of economists and educationalists on a programme of research entitled 'New job-skill needs and the low-skilled' the Newskills project financed under the targeted socioeconomic research (TSER) programme of DG XII of the European Commission. The countries represented and studied in the group were France, the Netherlands, Portugal, Sweden and the UK. In addition data for Germany were collected and incorporated in the research wherever feasible. The membership of the group is given in an Appendix.

2. The low-skilled – changes in earnings and employment

By the beginning of the 1990s in Europe it was becoming clear that an unprecedented change had overtaken the low-skilled on the labour market. Compared to the position in the mid 1970s the gap between the earnings of the low-skilled and the higher-skilled had widened in a majority of EU countries and in Canada and the USA. This trend resulted from large real wage gains at the top of the earnings scale and stagnant real wages at the lower end of the distribution (Machin 1998). In the United States where the labour market is more deregulated than in Europe and welfare less generous, the low-skilled group experienced a fall in real wages. In all of the EU countries included in the Newskills analysis except for Germany, earnings differentials widened over the period 1980–95. In France, the Netherlands and Sweden the change was only slight, but in the UK and in Portugal the change was relatively large (2).

In all industrialised countries from the late 1970s onwards the low-skilled were increasingly likely to experience spells of unemployment – in particular long-term unemployment (OECD1994a). The high and rising unemployment rates of the European countries compared with the US led a leading American economist to claim that US falling real wages and European unemployment are two sides of the same coin: in other words, in both cases the labour market was developing to the detriment of the low-skilled. In the flexible US economy this falling demand was reflected in falling real wages. In the more regulated European economies the wages of the low-skilled were kept artificially high at a price which meant that demand for the low-skilled fell (OECD op. cit.).

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(2) Change in the differential is measured as change in the ratio of the average earnings of those in the 90th earnings percentile:average earnings of those in the 10th earnings percentile. Data taken from OECD Employment Outlook 1996.

3. What accounts for the fall in demand for the low-skilled?

The debate on the causes of the falling demand for the low-skilled centres on whether the shift is caused mainly by the role of competition from industrialising economies (Wood 1994) or by the increasing role of technology in production (Berman, Bound and Machin 1997). Whatever the relative weight of these explanations most economists now accept that the following factors are important. First, the more efficient exploitation of information and control technology based on the microchip has helped to reduce the demand for much routine semi-skilled and unskilled work. Second, competitive pressures have increased within national economies in both the non-traded and traded sectors. These pressures have put a premium on improvement in the variety and quality of goods and services and account for much of the within-industry increase in the demand for more highly educated workers. In the traded sectors of the economy greater competitive pressures have resulted from the great increase in world trade. Companies are forced to become more efficient in order to compete internationally and this means adopting and exploiting fully all new technological aids to productivity. And to exploit fully the productive potential of new technology and thereby retain competitive advantage, firms require highly-skilled employees.

An analytical framework for empirical assessment of these issues has been developed as part of the work for the Newskills project by Mellander (1998). The model has been applied to a data set covering 24 industries in the Swedish manufacturing sector over the period 1985–95. These data make it possible to identify the demand for labour with different levels of education.

As in earlier studies (e.g., Berman, Bound, Griliches, 1994 and Machin, Ryan and van Reenan, 1996), a decomposition of the changes in the shares of employment for different categories of labour shows that changing employment shares are very largely the result of 'within-industry' changes, rather than 'between-industry' changes. This suggests that technical changes are an important driving force behind the fall in the demand for the low-skilled.

This hypothesis is supported by further results from the empirical analysis – so far carried out only for Sweden – which indicate that technological developments have markedly decreased the demand for low-skilled labour (defined as labour with only compulsory education). One way in which we can observe the effect of technical change is to note the increased demand for capital equipment which subsequently reduces the relative demand for low-skilled workers. By contrast, the demand for labour with upper secondary and tertiary education has increased as a result of technical change.

The development of relative wages of the different skill groups also plays an important part in the story. In the Swedish manufacturing sector, labour costs for workers with tertiary education have fallen steadily over the period, compared with the costs for workers with only compulsory education. The same is true for workers with upper secondary education, although for these the decrease in the relative wage is much smaller. As one would expect, these changes have been accompanied by continuous substitution away from low-skilled workers towards high-skilled labour. It is hoped that it will be possible to conduct similar studies for the UK, France and the Netherlands. For these countries the available data are, however, of poorer quality and/or less frequent.

4. Institutional factors and the demand for skills

Comparative labour demand analysis is scarce partly because it is not straightforward to incorporate institutional differences into such analysis and partly because of the lack of comparable data. In a companion paper (Kazamaki

Ottersten, 1998) to Mellander (op. cit) a number of differences in the institutional settings in the labour market in the countries studied in the Newskills project are examined. Institutional dimensions are divided according to categories where the first refers to the price-quality dimension, the second to the degree of regulation within the countries, the third to the degree of influence and the fourth to the degree of transaction costs. The fourth dimension incorporates the three previously mentioned dimensions and hence can be seen as a broader framework. Within this setting we focus on a number of variables which we compare between the countries, the unemployment situation, the distribution of wages, job protection legislation, practice on minimum wages, the duration of unemployment benefits, trade union density rates, and the regulation of temporary forms of employment contracts.

Ratios of earnings by educational level are also examined in the respective countries from 1970 to 1990. Clearly there are a number of differences between the countries on several of these dimensions. This makes the comparisons at the same time both challenging and compelling. For example, Portugal and Sweden are countries with very different institutional structures, the descriptive analysis, however, finds both differences and similarities between these two countries.

Given the nature of the different institutions, a number of institutional factors will be brought into the labour demand analysis in order to assess the effects of such factors. One example is the strictness of labour market legislation. This issue has been intensively debated in recent literature. In terms of the strictness of employment protection legislation there are rankings which suggest that such legislation is relatively low in the UK, high in Portugal and intermediate (or high in some classifications) in the Netherlands, France, Sweden and Germany.

There are various practices in these countries and even, for example, if Sweden is classified as a country with moderate employment protection legislation, certain practices, for example the last-in first-out principle still has very strict bounds, set by legislation, on the terms of dismissal. On the other hand, in terms of the regulation of temporary forms of contracts it appears that the overall strictness in Sweden is the lowest in reference to the countries that are included in the study. There are many dimensions that are interesting to study here, and these will be used to interpret differences in the results when the model developed in Mellander (op. cit.) is extended to other countries. This would make it possible to make some allowance for the institutional differences described above which may influence the demand for labour.

The role played by institutional factors in determining the rewards for skills is also considered in a paper prepared for the Newskills project entitled *Explaining international differences in male wage inequality by differences in demand and supply of skill* (Leuven, Oosterbeek and van Ophem 1998). This paper examines previous work by Blau and Kahn (1996) in which male wage inequality is compared across countries. A key finding by Blau and Kahn is that the relatively worse wage position of the low-skilled in the US cannot be attributed to a relatively large net supply of this skill group in the US. Instead they conclude that differences in labour market institutions between countries cause the larger wage dispersion in the US. Using an alternative skill measure (see below) and repeating the Blau and Kahn analysis, Leuven et. al. find results that are the exact opposite of the Blau and Kahn analysis.

Leuven et. al. find that international differences in wage inequality between skill groups are in line with differences in the net supply of these skill groups. The implications of these findings are the following. First, Blau and Kahn reach their conclusion that labour market institutions cause differences in wage dispersion, by implicitly assuming that educational institutions are irrelevant (a year of schooling in the US equals a year of schooling in Germany). The result obtained in the paper by Leuven et. al. supports the view that differences in educational systems do matter. Second, according to Blau and Kahn it is feasible to protect the wages of the low-skilled by implementing the right labour market institutions, since their results suggest that the lower wage inequality in the European countries relevant to the US is due to the protection of minimum wages, trade unions, and other protectionist institutions. Leuven et. al.'s (op. cit.) results, on the other hand, suggest that the relatively lower wage inequality in Europe is due to its lower net supply of low-skilled individuals. Leuven et. al.'s paper thus suggests that it is probably a better policy to reduce the net supply of low-skilled workers, in order to reduce wage inequality.

5. What has happened to low-skilled jobs?

Looking only at a period of 10 years from 1982 to 1992 considerable change has occurred in the distribution of employment between the different sectors of the economies of advanced industrialised countries. The story is by now a familiar one – the older sectors – agriculture, utilities and manufacturing have continued to lose out in employment terms to the service sector. In 10 OECD countries, including Germany, Sweden, and France the older sectors – agriculture, and manufacturing – have lost employment to services. Germany has lost just under half a percentage point a year over the 10-year period – at the other extreme France and the UK have lost three quarters of a point a year.

In the past, these traditional sectors were big employers of unskilled and semi-skilled labour and their decline inevitably means a continuing fall in manufacturing jobs traditionally filled by the low-skilled. But the service sector is also a source of low-skilled jobs and it might be thought that the expansion of the service sector could compensate the low-skilled for the decline of the traditional sectors. However, *within* all sectors – including the declining sectors – managerial and administrative occupations have increased their share of employment. A paper prepared for the project *Devenir des bas niveaux de qualification: comparaison des situations nationales* (Kirsch 1998) shows that the employment sectors which have seen the greatest growth in the period 1987–97 (health and social services NACE 85 and business services NACE 74) are largely composed of employees having an ISCED 3 or higher qualification. In those service sectors which traditionally employ high proportions of the low-skilled and which have expanded over the period 1987–97 the low-skilled have either experienced an absolute decline in numbers or have experienced lower growth than other groups. In those service sectors where employment has fallen, the fall has been greater for the low-skilled than for other skill groups.

Kirsch (op. cit.) also examines the situation of the low-skilled on six European labour markets. First results are available for a recent year only but earlier years are currently being added to the framework. In Germany and the Netherlands there is a tendency for the low-skilled in employment to be concentrated in just a small number of sectors of economic activity – for example in Germany low-skilled employment is principally in agriculture, textiles and clothing, paper, rubber and plastic manufacturing and in catering and private household services. In both Portugal and Sweden the low-skilled are employed in a much wider range of sectors in addition to the core low-skilled sectors mentioned above. These additional sectors of employment where the low-skilled in Portugal and Sweden can be found include a wide range of manufacturing, construction, motor repair and transport.

In the case of occupations it is possible to identify in all countries a hard core of occupations where the low-skilled tend to be concentrated (or over-represented). Beyond this hard core, national differences intervene – for example the low-skilled have a particularly high concentration in the construction industry in Portugal and in the tertiary sector in the UK – although this is not the case in the Netherlands, Germany and France.

We need to look not only at overall earnings and labour market prospects of the low-skilled but also whether other aspects of their employment are changing for better or for worse. A series of papers on a single theme 'The quality of new jobs/hires in Europe' is now under way as part of the project. Currently results are available for Portugal, the Netherlands and the UK. For Portugal and the Netherlands measures of job complexity and wages are available to assess the quality of new jobs/hires (Leuven and Oosterbeek 1998b). In the UK job quality is defined along three dimensions, in terms of real gross hourly wage rates, the rate of involuntary temporary employment and the rate of involuntary part-time employment (McIntosh 1998a).

Results for Portugal (1982, 1986 and 1992) show that in this country there has been a sharp increase in the quality of new jobs. For the Netherlands, using biannual data from 1986 to 1996, we find that the absolute quality of new jobs has not changed much over this period. There is, however, a tendency for the relative quality of new jobs to fall. This happened after 1992 and is due to an increase in the quality of old jobs. These developments have been disaggregated by level of education; the results show that in both countries the same tendencies hold for lower educated workers as well.

For the UK, results suggest that real wage rates have grown by roughly equal amounts in old and new job matches, while the rates of involuntary temporary and part-time employment have increased, but by more in old jobs than in new job matches over this period. Implications for the low-skilled can be derived when the results are disaggregated by skill level. This analysis reveals that the unskilled face a relative disadvantage in terms of hourly wage rates and involuntary part-time employment rates that have widened over the 10-year period. A widening of the skill differential in new job matches is found only in 1985. It may be that the new jobs created at this time worsened the labour market position of the unskilled, but that new jobs created in the 1990s have not widened the skill differentials any further.

6. Defining and measuring the low-skill group

It was envisaged at the outset of the Newskills project that the econometric and statistical analysis of labour market demand for, and supply of, individuals at low skill levels would use data drawn from national government surveys and international surveys such as the International Adult Literacy Survey (IALS). It was therefore decided that an important part of the contribution to be made by the educationalists in the project would be to advise on two points. The first of these concerns the allocation of national data on qualifications and educational levels to a common framework. The second concerns the appropriate cut-off point which would define the low-skilled group in all the countries studied as accurately as possible.

Three papers prepared within the programme of work have been concerned mainly or in part with measurement issues connected with work on low skills. In the first of these *Growing skills in Europe: the changing skill profiles of France, Germany, the Netherlands, Portugal, Sweden and the UK* (Murray and Steedman 1998) the definitions of educational level used in the International Classification of Education scale (ISCED) were adopted as the common framework for our project. Qualifications used in the national government surveys that were to supply data for the econometric and statistical analysis were allocated to the ISCED levels. This allocation was based on consultation among the project members and previous work on standards and qualifications in a number of EU countries. The allocation of national qualifications thus decided upon is set out in Table 1 of Murray and Steedman (op. cit).

Reasoning behind the decision about the most appropriate cut-off point for the definition of a low-skill group in Europe is set out in *Looking into the qualifications black box: What can international surveys tell us about basic competence?* (Steedman 1998). The paper examines the use of the International Classification of Education scale (ISCED) in order to establish which of the two lowest ISCED levels (0/1 and 2) constitute the most appropriate cut-off point for defining the low-skilled group. The ISCED 0/1 category was rejected as the cut-off point since, except in Portugal, proportions at this level are very low. The ISCED 2 cut-off point gives a more substantial low-skilled group in every country.

The choice of cut-off point was further reinforced by a study of data on unemployment and employment population ratios by skill level (Table 1 below). When unemployment and labour force participation rates were analysed by educational level for the countries studied, labour force participation was substantially lower and unemployment higher for the ISCED 0/1/2 group (completed compulsory education or less) while differences between the ISCED 3 group (vocational or academic upper secondary education of one or more years duration) and ISCED 5/6/7 (those with higher education) were very much smaller. Furthermore the labour market situation of the low-skilled so defined could be shown to have worsened during the 1990s while that of other groups had either remained stable or improved. It was therefore concluded that the ISCED 0/1/2 group should constitute the low-skilled group for the purposes of labour market analysis.

Steedman (op. cit.) also attempts to establish the extent to which the ISCED 0/1/2 level denotes a similar standard of skill/education in the countries studied, using the measures of literacy produced by the IALS as calibration instruments. This paper establishes two points of relevance to the use of the ISCED scale to identify the low-skilled across countries. First it can be shown that, for a young age group which has largely completed education (26–35 year age group), the ISCED 0/1/2 group contains similar percentages of the relatively low-skilled as identified by the IALS (those at IALS Levels 1 and 2) in all the EU member countries included in IALS (³). We can therefore be reasonably confident that the ISCED 0/1/2 identifies in each country a fairly homogeneous group of individuals in terms of standard of skill/education.

The second point of relevance concerns the individuals identified in the IALS survey as being at the lowest literacy level – Level 1. These individuals have difficulty with all but the simplest tasks of comprehension of the written word and we would therefore expect that they would be largely included in any low-skilled category based on education qualifications. This is the case for three of the EU countries so far covered by the IALS survey. In the United Kingdom, the Netherlands and Ireland around 80 % of those at IALS literacy level 1 are included in the 'below ISCED 3' category. In Sweden and Belgium where percentages at IALS Level 1 are very low – 2 and 5 % respectively – around 40 % are found below ISCED 3. Since most of those at IALS 1 in EU countries are to be found in the United Kingdom and Ireland it follows that over all, the 'below ISCED 3' category contains a high proportion of those at the lowest skill level on the IALS survey.

Definitions of skills based on the highest formal qualification obtained within the initial school system cannot claim to capture the reality of the whole range of skills that an individual brings to the labour market. Particularly in the case of those who also have labour market experience, the educational measure ignores additional skills acquired on the job and skills not certified. Here the IALS measure has distinct strengths since the measure will capture non-certificated skills acquired. However, the IALS measure is at present available for one year only and therefore could not be used as the basis for measuring skill for the econometric and statistical analysis of demand and supply over the period 1985–95.

However, Leuven, Oosterbeek and van Ophem (op. cit.) examine results produced by using IALS measures of skill compared with results based on a skill measure using average years of schooling, experience and experience squared. Their paper argues that the explanation of male wage inequality suggested by the IALS measure is in line with differences in the net supply of these skill groups in the countries studied. This finding contrasts with the opposite result obtained using measures based on average years of schooling etc. Using this measure a previous paper (Blau and Kahn, op. cit.) found the net supply of unskilled labour in the USA to be lower than in many European countries (including Germany) – a counter-intuitive finding not upheld

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(³) Unfortunately, these are not the same as the countries studied for the Newskills project. From the IALS we can investigate the following EU countries – Sweden, Belgium, Ireland, the Netherlands and the UK and make comparisons with the following non-EU countries – Switzerland, the USA, Canada and New Zealand. Sweden, the Netherlands and the UK are also included in Newskills. Although Germany participated in the IALS we cannot currently include Germany since the allocation of individuals in the survey to ISCED levels cannot be reconciled with our own analysis.

by any analysis of relative skill stocks in Europe and the USA.

We would argue that assessing skill levels on the basis of recognised qualifications obtained does not give as accurate a picture of skills as the IALS survey method but, since it does not directly equate a year of education in one country with a year of education in another, the ISCED level measure captures skill differences more accurately than years of education. There are other advantages to using ISCED levels. Information on educational level or qualifications is collected annually or biennially in almost all industrialised countries as part of a wider survey that asks questions about earnings, employment history, training, etc. This means that the relationship of low-skills so defined to other aspects of labour markets can be tested over a prolonged time period.

Stages of education completed or certificates awarded are also important labour market signals in their own right, used by employers and potential employees to convey information about skills and knowledge attained. This makes educational/training level a relevant measure to use when studying employers hiring behaviour as is done in the Newskills study of new jobs/hires. Finally, bringing about change in educational level/qualifications lies within the scope of government policy. Measures to reduce the proportion of individuals in the less than upper secondary category can be clearly formulated and their success monitored (4).

Because data from national sample surveys are available on educational level and labour force participation of individuals, it is possible to examine employment/population ratios for national populations by educational level as shown in Table 1 below. This measure is a useful one because it allows us to see the proportion of an educational group that is excluded from the labour market both by unemployment and through discouragement/early retirement.

Table 1: Employment/population ratios by educational attainment for persons aged 25–64, 1994

Employment/population ratios by educational attainment for persons aged 25–64, 1994
Percentages

		Less than upper secondary education	Upper secondary education	Tertiary level education
France	Employment/population	51.8	73.9	81.2
	Unemployment rate	14.7	10.5	6.8
Germany	Employment/population	49.0	70.2	83.4
	Unemployment rate	13.9	8.8	5.4
Netherlands	Employment/population	51.3	73.4	81.9
	Unemployment rate	8.2	4.8	4.3
Portugal	Employment/population	67.3	79.1	90.1
	Unemployment rate	6.0	6.2	2.5
Sweden	Employment/population	78.6	83.3	89.2
	Unemployment rate	8.8	7.6	3.6
United Kingdom	Employment/population	55.5	75.2	85.8
	Unemployment rate	13	8.3	3.9

Source: OECD: *Employment Outlook July 1997 Statistical Annex Table D*

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(4) For more extensive discussion of issues surrounding the construction of skill indicators see OECD (1994 b) and Ashton and Green (1996).

From Table 1 we can see that, on this measure, differences between the 'below ISCED 3' (less than upper secondary) group and the other two groups are considerably greater than differences between ISCED 3 (upper secondary) and 'above ISCED 3' (tertiary). The consistency of these differences across countries and the fact that they have been increasing over a 10- to 15-year period suggest that the problems of the low-skilled are the result of fundamental structural changes in labour markets.

Table 1 shows a recent snapshot of the labour market position of the low-skilled defined as the less than upper secondary group. In every country they have the highest unemployment rate *and* a much lower activity or labour force participation rate than the more skilled groups. In two-thirds of the countries surveyed barely half are in employment. This compares with around three-quarters of the upper secondary group in employment and an even higher proportion of the tertiary level group.

Kirsch (op. cit.) allows us to view the labour market situation of the low-skilled in relation to their relative supply in the six EU countries included in our study. For example, an indicator of inactivity is constructed as a ratio of the number of low-skilled in inactivity and the number who might be expected to be in inactivity if such a situation were to occur randomly. The resulting coefficient is greater than 1 if the group concerned is over-represented in the category analysed. Using this analysis, Kirsch points to differences between countries in the extent to which the low-skilled are considered employable. In the Netherlands and in Germany the low-skilled appear to be heavily discriminated against on the labour market, while in Portugal there appears to be little discrimination. (Table 2).

Table 2: Greater propensity of the low-skilled to inactivity by country ranking 1995

Netherlands	1.6
Germany	1.6
Sweden	1.5
France	1.4
United Kingdom	1.2
Portugal	1.1

Clearly the position of the low-skilled group is an unenviable one in the European Union countries considered here with the possible exception of Portugal. Their relative position and the deterioration that has taken place are all the more dramatic when we consider that the numbers of low-skilled in the labour force are considerably lower in the late 1990s than even 10 years ago. The fall in the supply of the low-skilled combined with the fall in their relative earnings and/or employment prospects means that the labour market has moved very decisively against them.

7. The low-skilled group across European labour markets

The changes described above have affected all advanced industrialised economies over the last two decades. But, using the ISCED scale as a measure, some countries have only quite small proportions of their populations with low skills. This means that the proportion of the population adversely affected by the fall in the demand for the low-skilled has also varied widely. Murray and Steedman (op. cit.) use data from national labour force surveys from 1985 to 1997 to follow changes in the proportions at the different ISCED levels in the six countries studied. Table 3 below is taken from this study and shows the differences in proportions of the population of working age who fall within the low skills ('below ISCED 3') category. An earlier year, usually 1985, is provided for comparison.

Table 3: Population of working age (16–64) at < ISCED 3, France (1990) **1996**, Germany (1985) **1995**, Netherlands (1990) **1996**, Portugal (1985) **1997**, Sweden (1985) **1996**, UK (1985) **1996** *(percentages)*

	France	Germany	NL	Portugal	Sweden	UK
< ISCED 3	(51) **43**	(35) **22**	(48) **41**	(87) **77**	(42) **28**	(65) **52**

Source: *Murray and Steedman (op. cit.)*

Table 3 shows that proportions at or below ISCED 2 range from around one-quarter of the population of working age in Germany and Sweden to around three-quarters of the population in Portugal. In the UK the proportion is just over half and France and the Netherlands have similar proportions around 40 %. In all countries, these proportions have been falling over the period considered here, roughly 1985–96. Lack of consistency in the classification of qualifications before 1990 means that for France and the Netherlands stocks of qualifications for 1996 cannot be compared over time prior to 1990. However, for the other countries the comparator figure in brackets in Table 3 is for approximately 10 years earlier. Table 4 below shows for all countries the average annual decline in the percentage of the population at or below ISCED 2 1990/91 to 1996/7:

Table 4: Countries ranked by average annual change in percentage of working-age population at or below ISCED 2 1990/91–1995/6/7

UK	—1.6
France	—1.4
Netherlands	—1.3
Sweden	—1.2
Germany	—0.9
Portugal	—0.8

Over the period from 1990 onwards it can be seen that, with the exception of Portugal, the countries that had high proportions with low skills at the beginning of the decade have made the fastest progress in reducing that group. The UK has made the greatest progress in reducing low skills in the working population since 1990. France and the Netherlands both show a rapid decline in low skills. Sweden has maintained the same rate of change in the period 1990–96 as for the previous five years. For Portugal, an important indicator is the extent to which the group with primary and less than primary education (ISCED 0/1) has been reduced. Over the twelve-year period Portugal reduced the ISCED 0/1 group (primary and less than primary education) by 10 % from 55 % in 1985 to 45 % in 1997.

This study concludes that the problem of the low-skilled is far greater in some EU countries than in others but that in all countries the low-skilled are a declining proportion of the working-age population. The decline in the low-skilled has accelerated somewhat in the 1990s – mainly as a result of the improvement of young people's education levels – but on present trends only Germany and Sweden will have a low skills group of around 10 % of the population by 2010. Portugal will still have around two-thirds at the low skills level and France, the Netherlands and the UK will have between one quarter and one third. In some countries women continue to lag substantially behind men and reasons for this continuing lag need to be explored and addressed. We conclude that only in Germany and Sweden will the problem of the low-skilled in the population of working age become of minor importance as a result of the continuing reduction in numbers.

8. Participation and access to education and training

Differences between countries in the proportion of the population of working age with low skills reflect changes in the participation in education by individuals over the past 50 years. The changes that can be seen in proportions with low skills at different points in time are for the most part a reflection of increased participation over time in upper secondary education.

A combination of labour market factors (changing demand for skills and experience), social factors (higher living standards, changing attitudes to education) together with changes in the structure of education systems, determine participation. In all the countries studied here, education systems have been modified over the post-war period in such a way as to make access to upper secondary education a realistic option for progressively larger groups of young people. However, some countries achieved an upper secondary structure that was widely accessible to all earlier than others. As a consequence of this early start those countries – Germany and Sweden in the sample studied here – have comparably lower proportions of low skills in the population.

The early establishment of a widely accessible *vocational* pathway in Germany and Sweden, following on from compulsory education, underpins those countries' success in reducing low skills in the working population. Even prior to the post-war period Germany and Sweden had well-established traditions of apprenticeship (Germany) and vocational education and training (Sweden) which have since evolved to provide a qualifying pathway for around half of the 90 % of the population who continue after compulsory school. (Steedman 1993, Nilsson and Svard 1991). For both Germany and Sweden, Green (1997) identifies a crucial role for State regulation and intervention in this process whereby the social partners (employers and trade unions) are induced to play a part in decision-making on content and outcomes of vocational pathways. It is argued that their involvement raises the credibility of the vocational pathway in upper secondary provision and encourages participation and persistence within the pathway.

A paper prepared for the project entitled 'The demand for post-compulsory education in four European countries' seeks to explain changes in the proportion of 16-year-olds, 17-year-olds and 18-year-olds who decide to participate in post-compulsory education (McIntosh 1998b). Four countries are considered; Germany, the Netherlands, Sweden and England from 1960/70 to the mid-1990s. The descriptive statistics assembled for this study help to explain the differences between EU countries in skill levels of the population (Table 3). Germany, where the low-skilled group in the total population is the lowest of the four countries considered, reveals enrolment rates in post-compulsory education for 16- and 17-year-olds which are around 90–100 % for the entire period for which data are available (from 1970 onwards). At age 17, however, female participation is around 10 % lower than for males which would also help to explain the finding in Murray and Steedman (op. cit.) that Germany continues to have a larger proportion of females than males with low skills. Sweden, where just under a third of the population is in the low-skilled group, also shows sharply rising enrolment rates for 16- and 17-year-old males and females which are slightly lower than German levels – around 80 %, rising to 90 % in the 1990s. Compared with Sweden and Germany, the Netherlands shows enrolment rates for 16-year-olds which are lower but still between 50 and 60 % in the mid-1970s. These rise sharply to around 90 % from the 1990s onwards. However, 17- and 18-year-old enrolment rates are lower than in Germany which may help to explain the rather higher proportion without an ISCED 3 level qualification in the Netherlands (41 %). England and Wales lag behind the other three countries and show only slow growth in post-16 participation until the late 1980s. Even now, rates are well below those of the other three countries. This slow development of post-compulsory education in England and Wales helps to explain the much higher percentage of the working age population in the UK without an ISCED 3 level – around half.

McIntosh (1998b op. cit.) analyses these time-series data using a co-integration framework to try to determine which of five variables – prior success in the education system, levels of household income, skilled/unskilled wage differentials, the existence of government-sponsored training schemes and levels of youth unemployment – appear to influence the decision to stay on in full-time education. The results suggest that the key variable that explains growth in post-compulsory education participation is the increase in prior academic attainment before the end of compulsory schooling. This is particularly the case for females, males also being influenced by the returns available to offering a higher level of education, and the level of real income available to spend on education. The level of youth unemployment seems to play only a small part in the decision as to whether to remain in education and the provision of youth training schemes an even smaller part. The key implication of this research for the low-skilled is that the early years of schooling can be very important since the degree of success obtained there serves to give students the confidence that they can succeed in further study. In addition, particularly for males, the maintaining of reasonable skill differentials in wages would seem to be a factor in persuading individuals not to remain low-skilled. For those who have completed their formal education with only low or no skills, job creation schemes and training schemes could be provided without the worry that such schemes would attract any significant numbers away from formal education.

Training provided by employers also makes a contribution to upgrading low skills. The Newskills project examined the supply of, and demand for, work-related training (Leuven and Oosterbeek 1997) using data from the IALS survey. The first phase of this work covered the Netherlands, Switzerland, Canada and the United States (data problems prevented the inclusion of Sweden and Germany). The second phase of this study will use data for other EU countries – Belgium, Ireland, and the UK where this proves to be of satisfactory quality. A key finding of this paper is that in all four countries firms appear to contribute to the costs of training which is likely to be useful in other firms as well (so-called general training). This contradicts one of the early insights in the economic theory of training but is in line with findings from other empirical studies. The second part of the paper presents results from an attempt to disentangle demand and supply of training. To that end information is used about workers who report that they are constrained in their training choices (they wanted more training than they actually received). A key finding of this analysis is that – again in all four countries – workers with lower levels of initial education receive less work-related training because they seem to be less interested in taking training, and not because firms want them to take less training than more highly educated workers.

The finding that firms are paying for general training suggests that one source of possible failures in the training market is probably less of a problem than is often thought. That is, it is often argued that there is a failure in the training market because workers have to pay the full costs of general training but are unable to do so because they face liquidity constraints. To the extent that firms pay these costs, this problem does not arise. The finding that lower training participation rates of lower educated workers are the result of the workers' preferences and not the firms' preferences suggests that policies to raise the training rates of these workers should be targeted at workers and not at firms. From this perspective the recent Dutch policy to provide firms with a tax deductions for training their workers is unlikely to be successful.

9. Summary and conclusions

This contribution presents the results of the first two years of work of the Newskills project. The final year will be spent testing our findings against the perceptions of the realities on the ground. We shall be organising meetings with the social partners at which we shall discuss our findings, carrying out case studies of firms in our five countries and surveying the views expressed by employers about the skills they need. At the end of this process we hope to be able to present a coherent and well-grounded view of the priorities to be adopted in improving skills in Europe both with regard to structures and broad content.

The research project's findings thus far can be summarised as follows: labour market conditions for the low-skilled are less favourable now than 10 years ago in the six countries studied with the possible exception of Portugal. In the UK a study of new jobs/hires over the period 1985–95 has shown deteriorating relative real wages for the low-skilled and higher rates of involuntary part-time employment. A comparison by educational level of job complexity in new and old jobs/hires in the Netherlands showed job complexity increasing for the low-skilled in 'old' jobs/hires but not in 'new' jobs/hires. A new analysis based on measures of male wage inequality across countries suggests that labour market institutions cannot be relied upon to protect the low-skilled from increasing wage differentials compared with the more highly-skilled.

The number of sectors of the economy in which the low-skilled can easily find employment is shrinking – again with the exception only of Portugal – and the likelihood of unemployment/inactivity is higher for the low-skilled than for other groups, particularly in Germany and Sweden. The cause of the fall in the demand for the low-skilled is still a subject of debate among economists but a study of firms' demand for skill using Swedish and UK data suggests that skill-biased technical change causes a fall in demand for individuals in the lowest skill category and a rise in demand for those in the higher skill categories. This process is hastened, when, as in Swedish manufacturing, wages of higher-skilled groups fall relative to those in lower skill groups. Employment/population ratios of the low-skilled ('below ISCED 3') group are significantly lower than for the other two skill groups and when measuring low skills, the 'below ISCED 3' (compulsory secondary education or lower) cut-off point was chosen. The 'below ISCED 3' measure was found to correlate reasonably well with low skills measures obtained from the IALS survey. The supply of low-skilled individuals is falling in all European countries studied but some countries continue to have half or more of the total population of working age at the 'below ISCED 3' level. Even if current growth rates of the 'above ISCED 3' group continue at their present level most European countries will still contain a significant group of the low-skilled in 2010.

In a majority – four out of six – countries studied, enrolment rates of young people in upper secondary education or education and training are sufficiently high to ensure that between 80 and 90 % will reach the 'above ISCED 3' level. Prior success within the period of compulsory education appears to be a greater spur to enrolment at the upper secondary level than the fear of unemployment. But the many low-skilled adults in employment will rely on employer-provided training to provide additional skills. Our studies suggest that employers do pay for transferable, general skills but that employees at the lowest skill levels show less interest in receiving training.

As the project enters its final year a number of conclusions with relevance for policy-making have already emerged from this work.

First, it is clear that the problem of the low-skilled is far greater in some countries of the European Union than in others but that in all countries it can be expected that their relative position on the labour market will continue to deteriorate. In the medium-term the low-skilled will continue to constitute a substantial minority of the population of working age in Europe as a whole. Longer and more effective education and training for young people will continue to reduce the low-skilled group in the population but participation still lags in those countries that have the largest low-skilled groups. Participation and success rates of young people can best be improved by boosting achievement in the period of compulsory education. The general, transferable skills of the adult population are improved by employer-provided training but this is currently at a level which cannot compensate for the deficit created by inadequate initial education and training. It seems likely that factors associated with risk and externalities continue to hold back firms investment in skills – firms may be unsure whether an investment in skills may pay off or, if it does, the newly-trained worker may leave for employment with another firm. In particular, the low-skilled appear more reluctant to participate in employer-provided training than those with higher level initial education and training.

Tables 1 and 3 in this paper provide a hopeful indication that reducing low skills can make a real difference to chances of a good standard of living.

Second, while it was shown (Table 1) that the labour market situation of the low-skills group is almost uniformly poor in all the countries studied, it was shown (in Table 3) that the low-skills group is much smaller in some countries than in others. It follows that the intermediate and high-skills groups are much larger in those countries – notably in Germany and Sweden. But what is striking is that the labour market situation of the more highly-skilled remains favourable in these countries in spite of much larger numbers with high skills relative, say, to the UK. We can, therefore, hope that a policy of bringing much larger numbers out of the low-skills group by education and training with high value-added can contribute to providing greater prosperity for many more citizens.

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B. Trends in occupations and qualifications: upgrading versus bumping down

Lex Borghans and Andries de Grip (1)

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Summary and outlook

In most European countries higher educated people tend to obtain jobs that used to be held by lower skilled people. This tendency is often seen as evidence for the claim that these labour markets face an over-supply of higher educated workers. As a consequence, it is thought, these higher educated workers occupy the jobs of people with a lower level of qualification, bumping-down these lower educated to even lower parts of the labour market. The aim of this contribution is to give an overview of the theories that explain the ongoing process of shifts of people with relatively high qualifications towards jobs that were formerly occupied by lower qualified people. Based on examples of research of the European labour market, the paper in particular focuses on the question whether or not this trend indicates underutilisation of skills (over-education) of higher skilled people and the implications of these shifts in the occupational domain for the lower skilled people who used to work in these jobs.

Introduction

In most European countries higher educated people tend to obtain jobs that used to be held by lower skilled people. This tendency is often seen as evidence for the claim that these labour markets face an over-supply of higher educated workers. As a consequence, it is thought, these higher educated workers occupy the jobs of people with a lower level of qualification, bumping-down these lower educated to even lower parts of the labour market (De Grip, 1987).

One of the first studies indicating this underutilisation of skills was Freeman's *Overeducated American* (1976). The policy implication of this theory would be that additional investments in education are not fruitful since as long as demand remains on the same level, additional supply of higher educated people would only seem to extend this bumping-down process. This theory therefore seems to contradict the policy of the EU and many of its Member States, namely to encourage further investments in human resources in order to increase European competitiveness and to prepare for the learning or cognitive society (European Commission, 1996).

Underutilisation of skills as a consequence of excess supply is, however, not the only theory that might explain the often observed phenomenon of higher educated people occupying jobs that used to be occupied by people with fewer qualifications. The alternative explanation states that due to technological and organisational changes, the complexity of the work in Europe increases, requiring more skills, i.e. an upgrading of the required skill level (Spenner, 1985). In contrast with the theory of underutilisation of skills and the bumping-down process that follows, upgrading would imply that employers need more highly educated people, even in jobs in which fewer qualifications used to be sufficient in the past. Due to the increased demand of highly skilled workers the labour market position of educated labour in the following would improve.

---

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The remainder of the contribution is organised as follows. In Section 2 we will deal with the relation between occupations and the required skill level. From an allocation theory point of view it is indicated that the relation between productivity and the educational background of employees varies between different occupations. Section 3 discusses different theories that explain underutilisation and their consequences. Section 4 concludes.

The aim of this contribution is to give an overview of the theories that explain the ongoing process of shifts of people with relatively high qualifications towards jobs that were formerly occupied by lower qualified people. The paper in particular focuses on the question whether or not this trend indicates underutilisation of skills (over-education) of higher skilled people and the implications of these shifts in the occupational domain for the lower skilled people who used to work in these jobs. In this sense the underutilisation of the skills of higher skilled workers employed in low-skilled jobs and the crowding-out of lower skilled workers of their traditional occupational domain are the reverse sides of the same coin. The latter can also imply that lower skilled workers are crowded out of employment entirely (Teulings and Koopmanschap, 1989 and Van Ours and Ridder, 1995).

1. What level of education is adequate for a job?

In everyday language it is common to state that a certain occupation requires a certain level of education. Applicants for accountant and internal auditor positions are required to have at least a bachelor's degree. Many employers prefer even those with a master's degree in accounting (Bureau of Labor Statistics, 1984, p. 24). On the other hand, some employers require a high school diploma for telephone operators (Bureau of Labor Statistics, 1984, p. 216). Examples like these illustrate that jobs are associated with certain levels of education. Consequently, graduates with a bachelor's degree working as telephone operators are said to be employed below their acquired educational level. An accountant with only a high school diploma would cause disbelief.

In such a simple picture of the relationship between education and work it is implicitly assumed that jobs of a certain level cannot be performed by people holding lower qualifications: the productivity of the latter is assumed to be zero. On the other hand, people with higher qualifications than are required for their job are thought to be completely wasting their abundant qualifications: their productivity in a job below their educational level equals the productivity of a worker with an adequate educational background (cf. Thurow, 1975).

Many empirical studies, however, question this rigid interpretation and suggest a more gradual relationship between productivity at the various job levels and educational background. Hartog and Jonker (1998) provide an overview of empirical studies which show a gradual, but non-linear relationship between education and productivity (2) at the respective job level. Typical results of studies on the relationship between wages and educational and occupational level are provided in Table 1. The table gives the estimates of Hartog (1985). It shows that the productivity of a worker with a certain level of education increases with the level of the occupation. At the same time the table shows following the diagonals B that in most cases the productivity of higher educated people in lower level jobs exceeds the productivity of lower educated at the same job level. Hartog tests whether the effects on productivity of the educational background of workers and the level of the jobs in which they are employed are complementary. In Hartog's paper this hypothesis is rejected, suggesting the existence of comparative advantages.

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(2) Empirical results which demonstrate this gradual non-linear relationship between education and productivity are based on the assumption that wages reflect productivity, although the match between education and skill is not optimal any more.

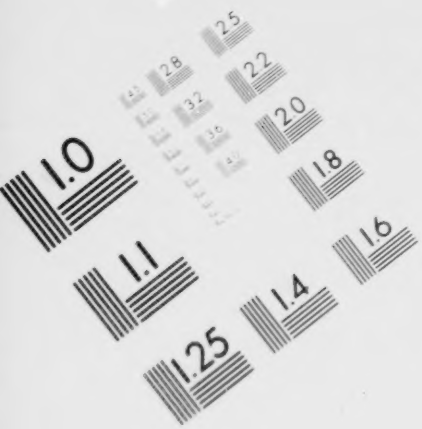
In the so-called allocation theory, introduced by Roy (1951) and Tinbergen (1956) as 'matching theory' both productivity and wages are assumed to depend on the level of skills. The relationship between productivity and skill level would vary between different jobs. The relationship between wage and skill level would be equal for the whole labour market, and might vary with the labour market developments. Figure 1 illustrates these relationships for a specific occupation. Such occupational productivity profiles have been introduced by Knight (1979). In this example the wage increases gradually with the level of education, while productivity rises sharply from around 14–16 years of schooling. For lower qualification levels productivity would remain low and would not catch up with the wage increase, while also for higher qualifications the higher productivity of one additional year of schooling would not compensate the increase in wage costs. The ratio between productivity and wage costs shows that for employers, workers with 17 years of schooling provide the optimal trade-off between productivity and wages. However, this implies that even the 17th year of schooling, which increases productivity only to a limited extent, still contributes more to productivity than it costs.

Figure 1 shows that although the productivity wage ratio reaches its maximum at 17 years of schooling, the ratio has only modestly lower values in the 16–20 years of schooling interval. This might imply that employers have rather indifferent attitudes towards people with educational backgrounds within such an interval. This is illustrated by the above BLS-quotations, in which educational requirements for a particular occupation were expressed in terms of at least this level, but which some/many employers prefer. It is important to notice that although employers are indifferent between employees with an educational background within this interval, productivity will in general not be equal for all workers in this group. Higher educated or trained workers will be more productive, but will also manifest higher wage costs. Within this indifferent interval productivity increases proportionally to the wage increase, however.

Table 1: The effect of allocation on log net hourly wage: Job level, relative to adequate match by education

Level of education	Lower	Extended	Intermediary lower	Higher	University, vocational
below job level	– (1.68)	0.063 (7.80)	0.288 (11.05)	0.508 (11.04)	0.536
equal	– (6.04)	0.170 (10.49)	0.440 (15.77)	0.607 (14.19)	0.860
above job level	0.115 (2.65)	0.330 (8.30)	0.478 (10.35)	0.829 (10.52)	–

Source: Hartog (1985)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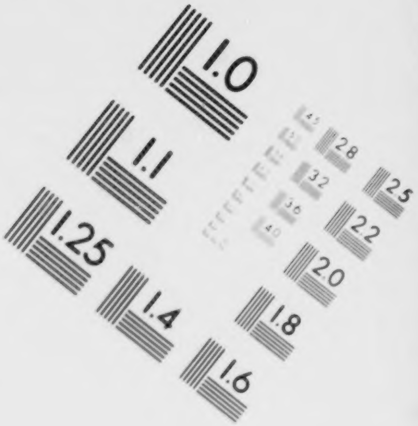
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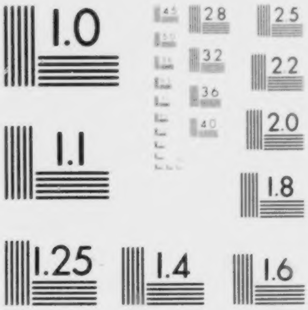
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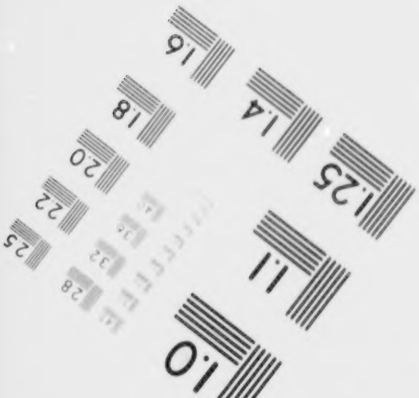
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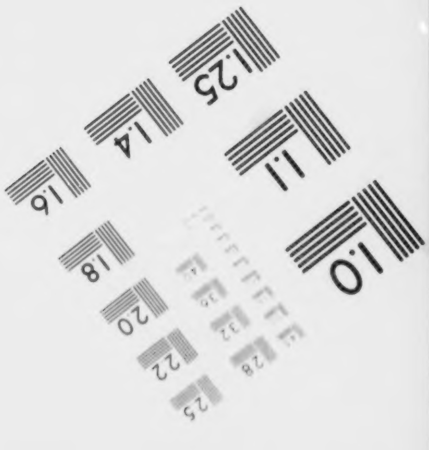
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Figure 1: Occupational productivity, wages and the optimal match between education and occupation

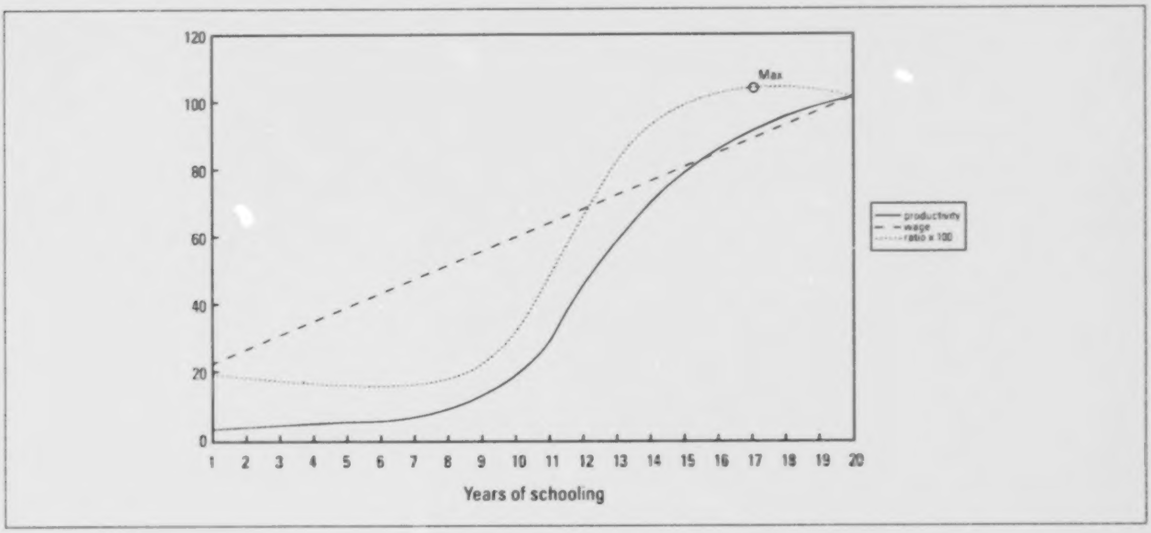

Figure 2 shows the function of the occupational productivity for another job. This job is characterised by a gradual increase in productivity in line with a higher level of education of the workers. As a consequence, employers will be indifferent about the amount of human capital an employee brings in. Borghans, de Grip and Smits (1997) classify occupations according to their required level, taking into account this proportionality between productivity and wages.

Table 2 provides the required educational levels for the lower segments of the labour market. It shows that while occupations like lower printing industry occupations and lower chemical industry occupations are matched exclusively to one educational level (Intermediate Vocational Education), other occupations like lower technical and industrial occupations and lower transport occupations seem to allow for a wider variety of educational levels.

Figure 2: Occupation with a proportional relationship between wages and productivity

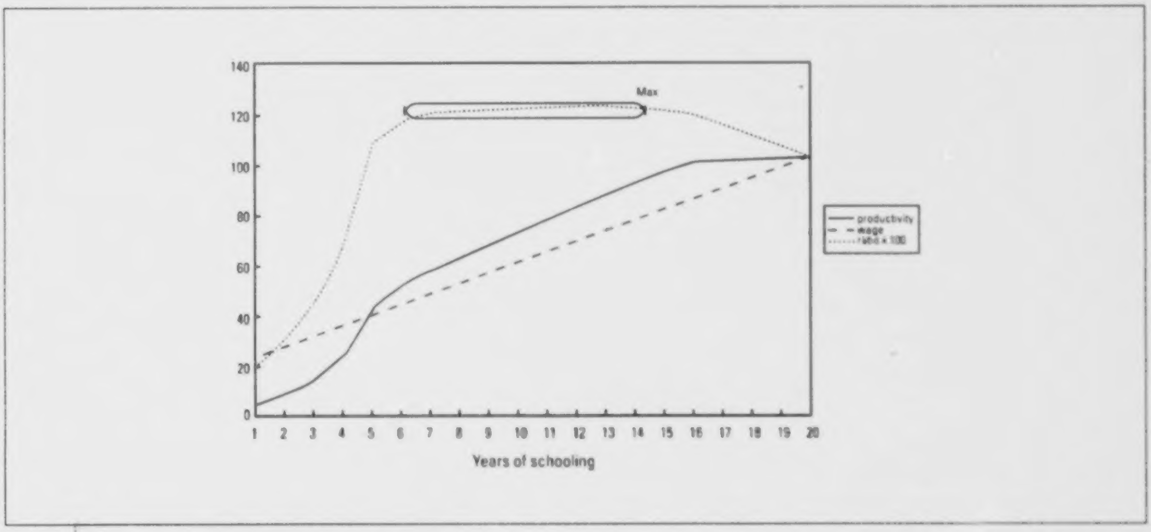

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Table 2: Classification of the job level of Dutch occupational segments by educational background of employed workers

Occupational segment	job level
Lower agricultural occupations	PVE/IVE
Lower technical and industrial occupations	Primary/PVE/IVE
Lower food and beverage occupations	PVE/IVE
Lower textile occupations	Primary/PVE/IVE
Lower wood and paper occupations	PVE/IVE
Lower printing industry occupations	IVE
Lower chemical industry occupations	IVE
Lower metals industry occupations	PVE/IVE
Lower electrical occupations	Primary/PVE/IVE
Lower building materials industry occupations	Primary/PVE/IVE
Lower construction and installation occupations	Primary/PVE/IVE
Lower transport occupations	Primary/PVE/IVE
Lower marine and inland waterway occupations	PVE/IVE
Lower road and rail occupations	Primary/PVE/IVE
Lower administrative occupations	PVE/IVE
Lower sales and purchasing occupations	PVE/IVE
Lower hotel and catering occupations	PVE/IVE
Lower service occupations	PVE/IVE

Primary = primary education
PVE = preparatory vocational education
IVE = intermediate vocational education

Source: Borghans, De Grip and Smits (1997)

Although the wage curve has been introduced in the Figures 1 and 2 as exogenous, in neoclassical theory it has to be regarded as the outcome of an equilibrium process. On each occupational market, demand in terms of units of production will depend on the production costs. Given the wage structure, it is possible to determine the required educational level per occupation and the demand in number of persons. Therefore the aggregate demand per educational level can be determined. If supply is assumed to be constant, i.e. the decision whether or not to participate in the labour market does not depend on the wage, this aggregate demand for a particular educational level might conflict with total supply at that educational level. Educational levels with excess supply will face lower wages, while educational levels for which demand exceeds supply show wage increases. An adjustment process of the wages will ultimately lead to an equilibrium of supply and demand for each educational level.

The resulting wage curve in this equilibrium indicates the returns to education. For each additional year of schooling it provides for the additional wage an employee might expect. If students anticipate these returns adequately, their educational investment decision will adjust to these returns in their educational choice. If certain levels of schooling have low returns fewer students will invest in this type of education. As a consequence returns will go up again. Assuming a perfect market for education/training in which students perfectly foresee the returns, the capital market is not restricted and the only benefits from education are the returns in the form of future wages, the wages curve will become approximately linear with a slope that depends on the discount rate (3).

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(3) Since more education will also shorten the period in which returns are obtained, the slope will raise slightly with years of schooling. Furthermore, Borghans (1993) discusses the effects on educational decisions of imperfect information about the returns, Kodde (1985) analyses the impact of constraints on the capital market and Oosterbeek and Webbink (1995) discuss the impact on educational decisions in respect of a consumption effect of education.

In order to analyse the causes of a changing match between education and jobs, it is not relevant whether the educational investments are in equilibrium. The only aspect that matters is that given the supply of educated labour, wages reflect the scarcity of educated labour. The optimality of the educational investments is, however, relevant to evaluate the social effects of changes in the educational investment attitudes of people.

Allocation theory provides an explanation for what is meant by the statement that for a certain occupation a specific educational level is required. This refers to the match which is optimal taking into account given production possibilities and given supply of labour. There are many reasons why in practice the match between education and jobs may differ from this optimum. However, also within this theoretical framework, the required level is not fixed, but might change. Such changes can result from shifts in the wage curve. These shifts can be a results of changes in (i) demand patterns for certain occupations (within respective units of production) or (ii) labour supply at certain educational levels. Further on, changes may also be a result of changes in the occupational profile linked to changing production process or work organisation. These changes are illustrated in Figures 3 and 4. Both the change in the supply of educated labour, which results in lower wages for more highly educated as shown in Figure 3 and the change in the occupational productivity curve as shown in Figure 4 results in a situation that people are employed in this occupation, with an educational background which is higher than it used to be. Such a shift might easily be associated with over-education or underutilisation. The question whether the observed shift has to be regarded as underutilisation depends on the point of reference used. If the actual supply of labour is regarded as point of departure both the situation in Figure 3 and in Figure 4 represent the optimal allocation of labour, and therefore it makes no sense to speak about underutilisation of labour. However, if the optimality of the educational investments is taken into account too, this interpretation might change. In Figure 3 excess supply has reduced the return to education, and therefore these investments can be regarded as inefficient. Underutilisation is the consequence. In Figure 4 the change in the production process increases the demand for more highly educated workers. As long as educational investments do not react to this new situation wages for the groups concerned will go up and as a consequence there is over-utilisation of labour.

Figure 3: Changes in supply and demand, reflected in the wages, and a change in the optimal match between education and occupation

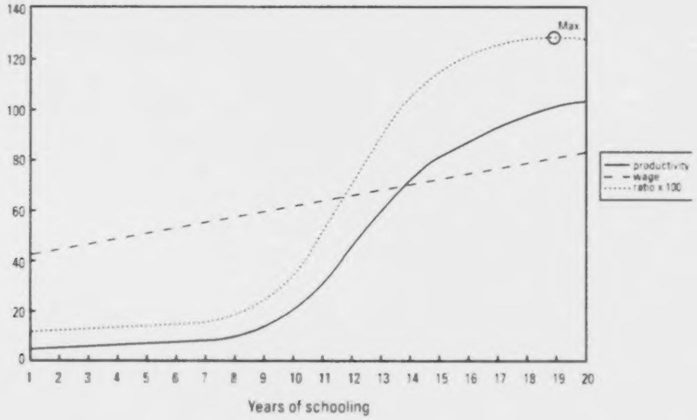
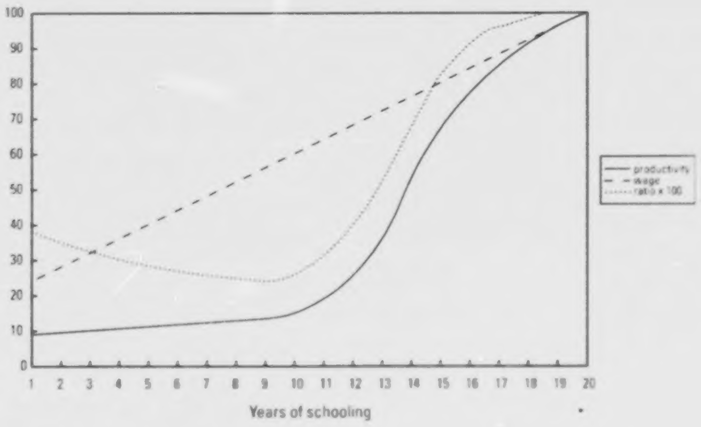


Figure 4: Upgrading and a change in the optimal match between education and occupation



2. Causes of underutilisation and their consequences

2.1. Macroefficiency

As stated in the introduction, there are two important empirical observations, linked to the fact that most industrialised countries are characterised by a close relationship between education and the labour market position in terms of wages and unemployment. The first observation is that people with higher levels of education or training earn substantially higher wages (cf. OECD, 1997) and may expect a much lower probability of being unemployed than those with less education (cf. Teulings and Koopmanschap, 1989). The second observation, however, is that a substantial proportion – in many cases also a rising proportion – of workers, have jobs that are said to be below their educational level. Especially more highly educated people have jobs that used to be occupied by people with a lower educational background. Seen together, these rather contradictory observations may provide for confusion among policy-makers. While the first observation suggests that additional education will improve the labour market position for lower-skilled workers, the second observation seems to reject this solution, by indicating an abundance of investments in education from a macroeconomic point of view. In the Dutch educational policy debate this question whether or not new investments in education contribute to social welfare has been called the macroefficiency of education.

The answer to the question about the macroefficiency of education is not straightforward. In Section 2 it has been shown that the concept of the required educational level for an occupation cannot be taken in absolute terms as it is often done in policy debates. The optimal level of education for certain occupations is an outcome of a balance between costs in the form of wages and benefits in the form of productivity for various skill levels that might be employed in the respective occupation. As both wages and productivity may change due to the relative security of workers in line with the various educational backgrounds and shifts in the occupational productivity profiles, respectively, the optimal level of education might also change. In Borghans, de Grip and Sloane (1998) it is shown what difficulties one might encounter when measuring the over-education or underutilisation of educated labour. Although occupations that used to be occupied by lower-skilled workers seem to be occupied by people with higher levels of education, it is not clear to what degree this really indicates an underutilisation of the workforce in these occupations. Empirical information therefore about such trends has to be treated with care.

To get a better understanding of the consequences of a policy that stimulates education and training of the low-skilled and low-paid workers, insight is required into the reasons why employment in certain jobs moves towards an increasing demand for more highly skilled workers. In this section, therefore, different theories will be presented that explain this observed tendency of a movement of jobs towards the employment of more highly educated people. The consequences of the alleged underutilisation in each theoretical framework for the group concerned and the consequences for the people who formerly used to work in those jobs will be discussed.

The theories concerned can be divided into two groups. First, allocation theory is able to explain downward shifts in employment, based on the occupational productivity profile. In this theory such shifts in the employment structure might be caused by changes in supply and demand per level of education or by a changing occupational productivity profile.

Economic literature provides some theoretical arguments, why one might expect a deviation from the optimal allocation of labour as described in allocation theory. These deviations have an impact on the interpretation of developments of the educational structure and its influence on the labour market. In Subsection 3.4 the consequences of such deviations from an optimal allocation will be discussed.

2.2. Increasing supply or decreasing demand for more highly educated workers

In allocation theory the worker-job match of people with different levels of education is regulated by the trade-off between higher wages versus increased productivity of the more highly educated. The relationship between wages and the level of education thus reflects the scarcity of the different skill groups. Changes in labour supply for certain skill levels or demand for certain occupations will in the following circumstances influence the wages and therefore the allocation of people within the respective range of occupations. If supply of the highest educational level goes up, or demand for jobs to which these workers are initially matched goes down, the optimal match of these people will shift towards the lower level occupations. Since these people become relatively cheaper, employers who have to recruit employees for occupations that require lower levels of education may then consider higher skilled people as a serious alternative, at least as far as the relative wages of the latter are low enough to be compensated by the higher productivity that results from employing more highly educated people in these occupations. Moreover, within their traditional occupational domain, employment opportunities for these higher skilled people may also increase since costs per unit of production will go down. The increase of demand in this own occupational domain depends on the elasticity of demand on the relevant product market. Assuming that this elasticity is rather low, the wage of more highly educated will decrease until there is enough labour demand within the lower qualified jobs for which they become then more attractive again. More highly educated people will then occupy part of the market of jobs at a level below their skill level. As a consequence demand for this skill level will fall. This effect is even amplified due to the higher productivity of more highly educated. The decrease in demand at the lower educational level will also decrease their wages. This will lead to a chain of shifts within the occupational domain of workers at the respective skill level.

If in all markets for educated labour the wage elasticity of demand is low, spill-over effects will transmit the excess supply at the higher occupational segments of the labour market to the lowest part of the labour market. The lower the wage elasticity of demand for different levels of educated labour, the more severely this tidal wave will ravage the lowest segments of the labour market. If the demand for unskilled labour is elastic, an increase in the demand for unskilled work with very low wages will result. However, if the demand for these unskilled jobs is inelastic too, the wave will be reflected as well as the higher levels of education.

The definite effects this would have on the allocation of workers are difficult to predict. It is more likely that the lower part of the labour market will be characterised by a group of unemployed people, who do not get a job be-

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cause their productivity does not exceed a minimum wage. Instead of an increase of unskilled and low paid jobs, the bumping-down process will then end in an increase in unemployment of low-skilled workers. As productivity goes down, a larger portion of workers will not compensate the minimum wage any more. This pool of unemployed is, by definition, elastic enough to absorb the demand shock that is left. Even within the framework of matching theory, it is possible therefore to explain a process of bumping-down, with a definitely increasing number of low paid jobs or unemployment for the lowest skilled groups.

Empirical research noticed that the unemployment rate of lower skilled workers is very sensitive to the business cycle. Teulings (1990) analysed for instance unemployment figures per skill level for the Netherlands. In Table 4 the analysed figures for 1979 and 1985 are indicated: in 1979 total unemployment was relatively low, while in 1985 the economy was in a deep recession. The table shows that the low-skilled people suffer indeed more from the recession than people with higher levels of education. From Teulings' (1990, p. 200) point of view, however, these results show that the actual labour market dynamics deviate from the neo-classical theory. In a standard neo-classical model of the labour market there is no room for unemployment. Wage flexibility guarantees supply to be equal to demand in each market segment. Apart from the discussion whether or not neo-classical theory leaves room for unemployment, the main difference between Teulings neo-classical framework and the allocation theory presented here is the endogeny of the optimal match between levels of education and occupations. Teulings assumes that each level of education has its own occupational domain and thus supply and demand always have to equilibrate within this domain.

In a recent Cedefop study by Mallet et al. (1996) for six European countries it was found that changes in the educational structure of the labour market are largely predicted by the rise in the level of education of successive generations (p. 15). A major piece of evidence for this claim is the results of a so-called RAS-procedure in which changes of both the qualification structure of labour supply and changes in the demand for occupations are simultaneously described (see Table 5) (⁴). It is shown that a variation in the supply of qualifications in the six countries explains to a large extent the changed allocations of people. Variation in demand contributed only partly, while the explanation of the RAS-model, in which variation in both supply and demand is combined, leads only to a modest increase in the explanatory power of the model. An important assumption of this model is that the demand for each occupation is exogenous and therefore does not react to the supply of higher qualified people.

(⁴) Van Eijs and Borghans (1996) provide an micro-economic explanation of this RAS procedure as the allocation process between qualifications and occupations.

Table 4: Unemployment by level of education in the Netherlands in 1979 and 1985

	Unemployment 1979 %	Unemployment 1985 %
Lower	6	24
Extended lower	3.2	14
Intermediate	2.2	7.6
Higher		6.3
Academic		6.2
Total	3.2	12.7
In persons x 1 000	167	751

Source: Teulings (1990)

Table 5: Determination (R-square) of different explanations of changes in the match between occupation and qualification

Explanation	France	Italy	Germany	Netherlands	Spain	United Kingdom
Variation in skill supply	91.2	80.0	87.2	66.3	89.2	91.9
Variation in occupational demand	79.4	63.3	69.6	14.2	84.7	71.9
Simultaneous variation	91.8	83.2	87.1	68.8	88.5	92.5

Source: Mallet *et al.* (1996)

Bumping-down, as an explanation of the tendency that higher qualified people tend to get jobs that used to be occupied by lower qualified people, is based on the assumption that demand does not react to an increased labour supply. Therefore a greater supply of more highly educated people forces them to accept jobs at lower levels. For that reason, when the supply of higher qualified people increases in time, as is actually the case in all (industrialised) countries, the more highly educated will find jobs at lower levels of required qualifications.

When this argument seems to hold, it could also be expected that instead of these comparisons in time, similar comparisons could be made between countries. Borghans, Hughes and Smits (1997) compared the occupational structure of both Irish and Dutch types of education. Since in 1985, in the Netherlands the portion of more highly educated people in the work force was much higher than in Ireland it would be expected that Dutch workers tend to occupy jobs that in Ireland are held by workers with a lower qualification level. As Table 6 shows, the opposite seems to hold true, however. The table provides the average similarity between the occupational domains of different types of education in both countries. For example the fact that the average similarity between the Irish MAs (Master of Arts) and the Dutch HVE (Higher Vocational Education) equals 0.12 means that the overlap between a random field of study at MA-level in Ireland has a similarity index with a random field of study at the Dutch HVE-level of an average 0.12. The conclusion from the table is that where formally Irish technicians should represent the same level of qualification as the Dutch Higher vocational education, in fact their occupational domain is closer to the Dutch intermediate level. This suggests that although the proportion of higher levels of qualifications on the Dutch labour market is higher than in the Irish labour market, this group seems to be scarcer in the Netherlands, resulting in higher level jobs. The relative large proportion of higher educated Dutch workers therefore seems to have produced an occupational structure in the Netherlands that requires much more qualified labour than in Ireland.

2.3. Upgrading

The alternative explanation the matching theory offers for shifts towards lower level jobs in the employment structure of people with a certain level of education is upgrading. If we suppose that for one specific occupation the productivity profile changes, then, due to the introduction of new technologies or organisational changes productivity goes up. Spenner (1985, p. 126) describes this as the logic of industrialisation (that) involves a division of labour that evolves along the lines of greater differentiation and efficiency. Technological change raises productivity, requiring a broader variety of skills and higher average skills from the work force. As a consequence, within an occupation that faces an increase in complexity, the optimal level of education will go up, even if wages for this group will increase due to their growing scarcity. Empirically this will be perceived as an increase of employment of these higher educated people in occupations

Table 6: Average similarity index per level within and between Ireland and the Netherlands

	Ph.D.	M.A.	P.G.	P.Deg.	High T.	T.	Low T.	UE	HVE	IVE
Irish:										
Ph.D.	0.48	0.34	0.15	0.24	0.11	0.09	0.13	0.16	0.05	0.05
M.A.	0.34	0.40	0.20	0.26	0.18	0.12	0.14	0.22	0.12	0.11
P.G.	0.15	0.20	0.31	0.21	0.19	0.19	0.22	0.16	0.12	0.15
P.Deg	0.24	0.26	0.21	0.24	0.12	0.09	0.10	0.17	0.09	0.08
High T.	0.11	0.18	0.19	0.12	0.36	0.34	0.38	0.10	0.12	0.20
T.	0.09	0.12	0.19	0.09	0.34	0.50	0.63	0.05	0.08	0.23
Low T.	0.13	0.14	0.22	0.10	0.38	0.63	0.96	0.06	0.09	0.30
Dutch:										
UE	0.16	0.22	0.16	0.17	0.10	0.05	0.06	0.21	0.10	0.08
HVE	0.05	0.12	0.12	0.09	0.12	0.08	0.09	0.10	0.24	0.15
IVE	0.05	0.11	0.15	0.08	0.20	0.23	0.30	0.08	0.15	0.36

Source: Borghans, Hughes and Smits (1997)

that were formerly occupied by people with a lower educational level. Since the new technologies imply increased productivity, employment in number of persons might reduce even further within this occupation.

For the level of education concerned by these trends wages will increase. Because the group of lower educated workers lost this occupational domain, other things being equal, demand will fall. Assuming again a low demand elasticity, their wages will go down. These lower wages might either make them competitive again with the more highly educated people who took over their jobs, or lead to a changed match of these skill levels with the job at lower levels of qualifications. Therefore also for these groups it will be observed that they occupy jobs that were previously occupied by those less qualified. While upgrading means an improvement of the labour market position for the skill levels which are directly affected by the changed occupational productivity profiles; for these workers with less education, the effects are equivalent to the situation of decreasing demand as described in the previous subsection.

So upgrading might again induce a chain of shifts in the occupational domains of workers with different levels of education accompanied with wage decreases for the lower educational categories. This may finally push the unskilled into low wage jobs or unemployment. For the lower parts of the labour market, the consequences of upgrading versus excess supply of more highly educated workers are not completely opposite as is often supposed. Only if upgrading tendencies occur on all levels of the labour force, does it seem fruitful to increase the education of the low-skilled in reaction to these upgrading tendencies.

Table 7 provides information about the changes in required qualifications in the United Kingdom between 1986 and 1997 from Green et al. (1997). Except for level 3 all educational levels show an increase in demand. If these changes reflect upgrading tendencies, they seem to affect all levels of occupations.

Table 7: Qualifications required in the United Kingdom in 1986 and 1997

level of education	1986 %	1997 %
high level	20.2	23.8
level 3	15.3	13.3
level 2	18.5	21.4
level 1	7.7	8.9
none	38.3	31.4

Source: Green *et al.* (1997)

Since in recent years the increase of higher educated school-leavers supply in the Netherlands has been stagnating, the process of upgrading is expected to dominate changes in the skills structure in the coming years. Borghans, De Grip en Heijke (1996) show that the occupational domains of different types of education are strictly separated, but overlap each other. This structure provides flexibility for the labour market structure and enables its gradual change. In their paper empirical results of labour market projections and the model, on which these are based, have been presented. Forecasts of the labour market by education and occupation predict labour market changes for the period 1995–2000. Their main survey result is: higher educated people will in the coming years become scarce on the labour market and are more and more expected to concentrate on higher level jobs, thus no longer bumping down those with lower skills.

The demand for school-leavers from particular types of education is determined first by changes in the employment in economic sectors. In addition to this *economic sector effect*, there exist also other changes in the employment levels for the various occupational classes within a single economic sector. This *occupational effect* is due to some extent to the heterogeneity of the respective economic sector. Moreover, the skills which are in demand within the range of relevant occupations also change. As a result of these changes, some types of education, which are better adapted to the developments in the demand for qualifications, will show a positive *education effect*. These three effects combined represent the shifts on the demand side. As a result of discrepancies between the types of education in demand and the available supply, there exist inevitably shifts in the demand. In that case, employers adjust their desires in accordance with the availability of workers. The latter effect has been designated as the substitution effect.

Table 8 shows the extent to which the demand for labour will change in the respective economic sector, occupational, educational and substitution effects in the coming five years. These changes in employment levels refer to net effects per educational level, so that positive and negative shifts experienced by the various types of education within the same level cancel each other out. The last line of the table completes this picture by presenting the sum of the negative and positive effects.

2.4. Fixed wages

Until now it was assumed that wages reflect the marginal productivity of people within each educational level. In the literature it is often claimed that the labour market does not react in the way assumed by neo-classical theory. Absence of wage adjustment, i.e. fixed wages of each occupation/type of education, leads to job competition rather than wage competition. In this section we will discuss the consequences of both fixed wages for each occupation and fixed wages for each type of education. The main theoretical question that remains unsolved by these theories is why

Table 8: Components of changes in employment levels per educational level (net effects), 1995–2000

	Sector effect %	Occupational effect %	Educational effect %	Substitution %	Total %
Primary education	4.2	–4.2	–13.1	–1.7	–14.8
LGSE, PVE	4.0	–3.1	–5.4	–3.2	–7.7
HGSE/UPE, IVE/app.	4.6	–1.0	1.8	–0.7	4.7
HVE	3.7	5.8	4.9	3.8	18.2
UE	3.7	7.1	9.3	7.2	27.3
Total (net)	4.2	0	0	0	4.2
Total (all changes)	4.6	3.6	4.9	2.9	10.6

Source: Borghans, De Grip and Heijke (1996) wages are not adjusted. Economic literature offers a wide range of explanations. Most favour nowadays the efficiency wage theory or the equilibrium search theory. In the latter theory an equilibrium is characterised by above equilibrium wages and the rate of unemployment by the rate of underutilisation.

In the neo-classical allocation theory described, a decrease in demand for higher educated workers may induce a bumping-down process in which workers with a certain educational level take over part of the jobs in the occupational domain of people with a lower level of education. This process may then push the unskilled into badly paid work or into unemployment. Assuming elasticity of demand to be close to zero for educated labour, additional education for these unskilled workers will not necessarily improve their situation on the labour market; since this will only lead to additional supply of higher workers with levels of education which will further extend this bumping-down process. An important characteristic of this model is, however, that higher educated labour will receive lower wages. Since in a neo-classical framework wages will be equal for all labour with the same personal characteristics, the wage will fall not only for those who have to accept a job that used to be in the occupational domain of those who are lower educated, but also in their own traditional occupational domain. Although productivity might be higher within the higher level jobs, wage competition among workers with equal characteristics for these scarce jobs at their own level will push wages downward until they are equal to the productivity in low skill jobs that have to be accepted by part of this group.

Although wage competition might lead to a bumping-down process, it will also diminish the returns to education. If students adequately anticipate these returns and their educational investments are based on the expected benefits of their investment, educational investments might diminish. This would lead to a downward adjustment of supply due to the lower enrolments in higher education. However, although many countries faced shifts of higher educated workers to lower level jobs, a reduction of an average investment in education has not been observed so far.

These observations might suggest that the labour market is not regulated by wage competition but that job competition rules the market. Introduced by Thurow (1972, 1975) (5) it is assumed in the job competition model that wages do not directly reflect the marginal productivity of the workers of a certain educational level. In contrast, it is assumed that each type of job is characterised by a constant wage level. Knight (1979) illustrates that if the productivity of workers increases with their educational level, all employers will prefer to employ the highest qualified people, even if the additional productivity compared with lower levels of education is rather low. These uniform preferences create what is called a queue of workers. The workers with the highest skill levels are in front of the queue and have plenty of choice between all different jobs; they would therefore choose the best paid occupations. For people with fewer qualifications best paid jobs will not be available and therefore, similar to the queue of workers, a job queue will arise. The outcome of this allocation process will be that number one in the worker queue will be matched with job number one, etc. If demand decreases in best paid jobs everyone will shift some places downward in the queue. Reduced demand or excess supply for the high level jobs will therefore again result in a bumping-down process that will either result in badly paid jobs or in unemployment for the people at the end of the queue.

Although the wage competition model and the job competition model are often seen as opposite theories, both theories seem to allow to explain to same process of bumping-down. There are three important differences between both theories, however. In the first place a bumping-down process is not an inevitable consequence of the neo-classical matching model. Only together with the assumption of low elasticity of demand a decrease in will demand for the higher level jobs be transmitted to the lower parts of the labour market. In the job competition model the bumping-down process will always take place in the event of a decrease in demand for the higher level jobs. The reason for this is that with constant wages *de facto* no demand elasticity exists. Wage competition therefore seems to be able to predict a wider range of market mechanisms among which the extreme bumping-down case is one.

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(5) Reder (1955) introduced the idea of occupational wage differentials two decades before Thurow.

The assumption of job related fixed wages, creates, however, two other differences between wage and job competition, which obstruct efficiency in the job competition model. First, the marginal benefits of educational investments in the job competition model do not equal the wage in the marginal job. If one more worker is schooled for the highest educational level, this will push one of the highest educated into a less favourable job. The marginal benefits are – in contrast with the wage competition model – larger than the wage in this less favourable marginal job; since every worker with the respective educational background will only face a probability to fall out of the favourable occupational domain into these marginal jobs. Decreasing demand will thus not necessarily provide a signal to reduce educational investments.

Second, the allocation between workers and jobs might be obscured in the job competition model too. Since wages are fixed for each occupation, workers will not be allocated in the jobs where their productivity is optimal, but everyone will try to obtain those jobs that are best paid. If the jobs with the highest wages do not provide the highest comparative advantage for highest skilled people, talent will be wasted in less productive jobs. Murphy et al. (1991) provide the example of highly rewarded lawyer jobs reducing national growth rates by preventing people from becoming engineers.

The implications of the job competition model regarding the macroefficiency of additional training for the lower part of the labour market to escape from low pay or unemployment are more pessimistic than in the wage competition model. In the first place an increase in the supply of workers with higher levels of education will leave demand for those occupations totally unaffected. Improvements in the labour market position of those who receive additional schooling will be fully compensated by the deterioration of the labour market position of those who remain unskilled. Not only when decreased demand leads to a bumping-down process might it be more efficient to reduce educational investments rather than to increase them, but even if demand increases there are good reasons to believe that the actual level of education exceeds the optimal level of education.

Crucial in the job competition model is the difference in wages between those who are lucky to find a job that matches their educational level, and those who have to accept a job below their skill level. The burden of excess supply is completely imposed on losers in the competition for the favourable jobs. Borghans and Smits (1997) investigated this implication. Table 9 shows that school-leavers from the Dutch higher vocational education receive higher wages if they are employed in jobs for which higher educational levels are required. This confirms the findings of Hartog (1985) provided in Table 1. The larger the percentage of school-leavers that finds a job below their educational level within a specific labour market segment, the lower the average wage of the total group will be. A deterioration of the labour market affects wages of those with a job, which matches their educational level, substantially more, than the wages of underutilised workers. This suggests that increased competition at the labour market leads equally to wage competition within the traditional occupational domain that matches the level of education.

Van Ours and Ridder (1995) reject the job competition model because they estimate that in the job matching process people with higher education do not substantially reduce the matching probabilities of lower qualified people within other segments of the labour market in the event of a low number of vacancies within their own occupational domain. Higher unemployment rates among low-skilled people are according to Van Ours and Ridder (1995) explained by higher quit rates. Although their findings provide very interesting insights into the functioning of the labour market, it is not clear, however, why the job competition model requires a reallocation induced by shifts in demand and supply to be realised through a changing matching behaviour rather than changes in the quit ratio.

Table 9: The average wage of school-leavers from higher vocational education in the Netherlands in relation to the proportion of school-leavers with a job below their educational level, t-values in brackets

Required educ. level for job	constant	% below educational level
Lower	14.76 (9.75)	6.44 (1.09)
Intermediate	18.84 (26.91)	2.70 (0.98)
Higher vocational	21.45 (26.34)	5.25 (1.63)
More than higher vocational	21.45 (24.16)	2.34 (0.67)
Total group	21.31 (30.66)	6.13 (2.24)

Source: Borghans and Smits (1997)

3. Conclusions

It is interesting to notice that for the policy question whether or not labour market developments make additional investments in schooling worthwhile, the opposite positions of the wage competition model and the job competition model are not crucial. The most crucial point is whether increased employment of higher educated in jobs on lower levels suggests the occurrence of a bumping-down process initiated by excess supply for the more highly educated or whether it points to a process of upgrading. Bumping-down that can be the result in both the job competition model and the neoclassical matching model suggests that additional investments in education are not very effective. Upgrading on the other hand asks for increased educational investments. Upgrading versus bumping-down therefore seems to be the most fundamental contradiction with respect to the macroefficiency of training policies for low-skilled and low paid workers.

Two differences between the job competition and the wage competition model remain important, however. First, from the point of view of the wage competition model, bumping-down is only an extreme case. The model does not exclude that additional demand will absorb parts of an extra supply at a certain level of education, which results from training policies. The effects of training therefore do not need to be totally cancelled out by a bumping-down process, but might also lead to new employment opportunities at higher wages, depending on the elasticity of demand at the higher job levels. In the job competition model, elasticity of demand equals zero, however, since wages will not react to changes in supply and demand.

Second, although both in a world of job competition and in a world of wage competition upgrading might occur, in the sense that jobs become more complex, the labour market will provide no signals for this in the job competition case. In the case of wage competition it might be very difficult to distinguish upgrading from bumping down, since both processes will lead to a shift in the employment structure of higher educated people to jobs that used to be occupied by those with lower education. Upgrading does, however, manifest itself in a changing employment structure. In case of job competition neither the allocation of workers, nor their wages will be changed due to upgrading. The increased productivity of the higher educated, which might make more educational investments fruitful will therefore remain unnoticed.

Finally, it is interesting to notice that not every form of training will be a useful instrument to cope with upgrading. It has been shown that upgrading in a specific group of occupations and at a certain level of education may induce bumping at lower levels of education. Therefore training seems to be fruitful only if it increases the supply at a level of education for which the upgrading process created a new demand. Training that increases people's educational level below the level, at which these upgrading tendencies occur, stimulates the process of bumping down only further.

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C. The impact of information and communication technologies (ICTs) on the development of occupational skills and training needs

Lázaro González (1)

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1. Introduction

Information and communications technologies (ICTs) are having a marked impact on all areas of human activity, though this impact varies from country to country and region to region due to profound inequalities in terms of access to the so-called information society. Nobody wants to be left behind in the communication and democratisation of information, but the poorer sectors are still a long way from gaining access to information networks or generating the content of those networks.

One of the areas most affected by the widespread use of ICTs is economic activity, since these technologies are causing a real revolution in business production methods, especially in the more technologically advanced countries. This revolution is also affecting professional competence and status and the skills required of workers. New technological tools and instruments are opening up new possibilities as regards optimising production, communicating with internal and external clients and producing previously unimagined goods and services, breaking down the traditional limitations of time and space.

New areas of training and new ways of organising the updating of knowledge and skills in the workplace are also being established as a result of the impact of ICTs.

Trends appear to be similar in all European countries or, at least, this seems to be a reasonable hypothesis, which is supported by studies conducted by Cedefop in several European countries and among companies in the telecommunications and administration sectors (see Bibliography). ICTs are an important instrument in the process of globalisation and it is, therefore, not surprising that they are also serving as a means of standardising methods of work organisation.

What impact are ICTs going to have on occupational skills and training in the medium term? What are the primary training needs going to be? How should we begin to shape training actions in production environments in which extensive use is being made of these technologies? What sort of professional profiles should the new trainers have? These are the questions that we shall try to tackle in this article, in a modest attempt to build upon areas that already have an established place in the literature on this subject. The opinions and judgements expressed here are supported by case studies of major companies that make extensive use of these technologies, as mentioned earlier.

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2. The impact of technological innovation

This section focuses solely on the impact on the organisation of production and on occupational roles, since this will give us a clearer understanding of the consequences as regards occupational skills and training, which are the main issue we wish to cover here.

2.1. The impact of ICTs on the organisation of production

New technologies are introduced into companies essentially with a view to improving competitiveness: better products, faster service, lower costs. In turn, by comparison with traditional methods, these technologies imply lower consumption of energy, raw materials and non-renewable resources.

ICTs have become a kind of magic ingredient in many of the strategic options or modernisation models chosen by many companies, though it has to be said that they are sometimes nothing more than a fashion item, purchased as a result of the aggressive marketing of new hardware and software and because of the aura of wisdom that computer specialists have managed to create for themselves in some companies. No manager wants to be left behind in terms of technological improvements, however, especially if he knows that his competitors have already introduced them.

Telecommunications are currently at the centre of technological innovation in companies. Although many of them, especially small enterprises, are still using only a tiny proportion of the potential of their computer equipment, those that can boast a leading place in the market have gone beyond the stage of using computers simply to process information.

Today, it is the network that is the main model for technological change. The objective is to improve internal and external communications, and not simply to process information, as before. The principle that underlies exchanges is that of client-provider, whereby the provider supplies all manner of services through a network to a client who may be in a different or distant place.

Groupware is rapidly becoming popular, since it makes it possible for different activities to be performed with greater autonomy and efficiency and also makes it easy to integrate the contributions of the various members of a team in the same production process. Virtual enterprises, with a diffuse location in time and space, are already a possibility, thanks to these technologies.

We shall now look at the main repercussions ICTs are likely to have on the organisation of production, if the trend towards their widespread use persists.

Spatial and temporal models of production will change.

An enterprise is no longer simply a permanent physical establishment or establishments at which goods or services are produced. Today, anywhere with access to a network may be part of an enterprise or department. An enterprise can even be set up simply for the implementation of a single, specific project by people working miles apart or close together, who transmit messages to each other in real time or interact asynchronously to develop a joint product.

This change in habitual spatial and temporal production scenarios is going to demand a similar shift in the way we perceive working hours, occupational guarantees, management methods, etc.

Essentially, the enterprise is becoming a place for the management of knowledge. Of course, this may seem a distant reality for some enterprises at the moment, but the signs are pointing in this direction. The main concerns as regards this management of knowledge within the enterprise may be:

- how to manage the abundance of knowledge and skills the organisation has been

accumulating throughout its existence and how to incorporate new knowledge. That is, how to organise the 'collective intelligence' mentioned by P. Levy;
- how to redistribute power within the enterprise, when all workers are using the network to handle information that was previously handled by only a select few;
- how to decentralise execution while keeping planning and control centralised;
- how to protect the enterprise's fund of knowledge against competitors or external assailants who also have powerful information and communications equipment.

The new managers are therefore going to need new skills based on the ability to manage collective knowledge.

The organisation of production must shift away from a functional structure and towards a transversal approach.

The traditional division of labour in companies has been vertical, separating design and execution, and dividing activities into functional areas or departments. Coordination between departments has been on the basis of standardised function guidelines and procedure manuals.

The introduction of ICTs into production processes is bound to change this organisational culture. Each concrete production project becomes the focus of activity and enterprise organisation, since the client and his demands are what matter. Producing goods and services just in time, to the highest possible quality, at the lowest possible cost and with the greatest possible innovation are the driving principles. Technologies make it easier to achieve these objectives, but they also make it necessary to set up transversal work teams for a project, with less focus on specialisation or the functional division of tasks. The 'password' or checks on access to certain information have to be suppressed, because all members of the team working on the project must have that information available to them. What is more important, hierarchical levels of decision-making concerning the project also have to be done away with, since the human team, with the aid of technology, is more efficient if it works transversally.

Production organisations are subject to constant mobility. This is not only because of technologies, which are merely a dependent variable of organisational change. Technologies are contributing, however, to this current of change, some of whose main trends are:

- permanent structures (human and material) are becoming smaller and smaller;
- it is increasingly common for enterprises to be set up for specific projects, with a limited life;
- maintaining a network of inter-company links is an important factor of competitiveness, and the exchange of knowledge permitted by technologies is helping to strengthen these links.

This ongoing enterprise mobility may have desirable and undesirable effects for workers and the economy, though this is not our concern here. We simply mention it since we are identifying the various influences of technology.

2.2. The impact of ICTs on occupational roles

The impact of technologies on workers' tasks is similar to that on production. Some of the more obvious examples are described below.

Human activity in companies is increasingly becoming a question of handling information and, to a certain extent, knowledge.

The introduction of technologies in production processes means that repetitive tasks are being automated, both in offices and in factories. Workers employed to perform repetitive tasks are falling in number or tending to disappear completely from the workforce. This is true in the case of administrative assistants, telephonists, telegraph operators and workers performing simple manual tasks. In this respect, technologies are contributing to the loss of some jobs, though they also create others. At the same time, they may increase the polarisation between those performing basic manual work and those who are capable of working with the more abstract codes of information.

Execution tasks, which are increasingly decentralised, basically consist of decision-making on the basis of available information, which is increasingly abundant and accessible to all workers. As holders of special knowledge that is of use to the enterprise, specialists are gaining an increasingly important role.

A fairly high proportion of human-resources managers interviewed believe that ICTs will enable businesses to move towards a model for the organisation of knowledge in which workers' personal development will become increasingly important as the key to maintaining a leading position on the market. A high level of personal development will be reflected in the ability to use one's own initiative, work as part of a team, seek new ways of thinking and doing, and utilise the knowledge that exists within the entire organisational system. Nevertheless, it has to be admitted that this is really a dream for the future that many enterprises are still far from realising. It must be acknowledged, however, that many companies are still bureaucratic organisations in which decisions tend not to be based on criteria of rationality, or in which managers fail to draw on the fund of knowledge represented by the workforce, because they are afraid of losing their power.

Technologies per se do not imply innovation. They have to be accompanied by a change of culture, so that they can become tools at the service of creativity. Bureaucratic organisations, however, tend to see them more as an instrument of control than as an instrument of personal development.

The role of the individual specialist is gradually losing importance in favour of the project team.

ICTs are now making it possible for many people to access specialised information that was previously the preserve of the few. The role of the specialist, who closely guards his knowledge and uses it as currency on the labour market, is dwindling.

Learning to share experience and know-how in a concrete project to achieve excellence collectively is more important than having a high level of personal specialisation.

Groupware, which is being used more and more often in competitive projects, depends not only on the contribution made by each individual expert but also on traditional team skills, such as being able to communicate and collaborate and being willing to learn from others.

The occupational classifications traditionally used by companies are becoming obsolete.

Many job lists now have a purpose that is more administrative than functional. If we were to study possible future changes in occupational skills on the basis of existing posts, we should find that many of these posts are likely to disappear or change over the next few years.

The introduction of ICTs in companies is contributing to a shift in the amount of information, decision-making powers and functions held by the various job categories.

Companies that make extensive use of new technologies are increasingly opting for transversal roles: for example, an engineer must be able to sell what he has designed, an administrator must be able to deal with the public, an accountant must get used to consulting others, a maintenance worker must be able to assess the economic or social consequences of his work, etc.

The number of occupational categories is diminishing both as a result of this transversalisation of roles and because of the reduction in the number of hierarchical levels. Some standard occupational categories now operate on more than one organisational level.

This overall process of change affecting occupational categories is already having a significant impact in several very diverse ways:

- if they are to have any predictive value, studies of training requirements must be based not only on analysis of existing posts but also on more transversal profiles;
- collective bargaining will have to take account of these new trends towards transversalisation and not focus solely on guarantees for previously existing profiles;
- the functional organisation of many companies must be adjusted to this situation;
- training must give yet more importance to transversal content.

3. Trends in the development of occupational skills as a result of the impact of ICTs

The case studies of businesses included in the Cedefop studies mentioned earlier seem to suggest that the introduction of new technological solutions is also leading to changes in occupational skills.

These Cedefop studies have examined changes in occupational skills using the following methodological steps:

- identifying the main functional areas of production and the extent to which technologies are used in each area;
- identifying standard occupational categories in the various functional areas. A standard occupational category is defined in terms of a set of skills required to take on a highly sought-after occupational role within a specific functional area;
- analysing the skills required of a particular occupational category at that moment and predicting how those skill requirements are going to change in the medium term, as a result of the introduction of new technologies.

The findings of these studies enable us to make a set of judgements that are described below.

3.1. Ways in which professional competence and status will change in the medium term as a result of the impact of ICTs

On this point, it is impossible for us to make any accurate predictions that will be valid for all European countries, every economic sector or any type of enterprise. This is because the extent to which technologies are used varies, depending on the country, region or enterprise concerned, with the information society being more of a reality for some countries and sectors than for others.

However, we can point to a number of trends that are likely to become more marked in the next few years.

Widespread use of ICTs as a work tool is highlighting the central role played by the human factor and occupational skills in the new professional competence and status.

Fortunately, contrary to the old belief that technologies dehumanise workers, new technologies are vindicating the human element. In fact, the use and application of technologies require the development of a combination of personal skills that has always been one of the basic objectives of education and training.

In a context in which information and knowledge are the essential raw material that has to be located, processed and used rapidly and accurately in decision-making, people's ability to continue to learn, to adapt to new situations and to think systematically or holistically becomes the vital core of the professional competence required.

The ability to use computers is much more than a question of manual skills or good hand–eye coordination. It involves asking oneself why one needs to use this equipment, what the information retrieved is needed for and how that information can be used to improve the quality of work.

The first trend to be identified, therefore, is that the use of ICTs is going to call for a shift in professional competence towards greater creativity and initiative and a more holistic vision of production processes. Consolidation of this trend might have various consequences for production, employment and work organisation, some of which might not be desirable. We shall now look at some of these consequences.

It is possible that there will be a mismatch between current vocational training – including new curricula that still focus too much on the functional aspects of work – and the demands of the production system, placing high value on personal skills.

People with a low level of basic training, who are less adaptable to new forms of production, are gradually going to find themselves excluded from employment in companies that make extensive use of ICTs. This is already a serious social problem, and answers will have to be found in education and vocational-training systems.

'Able' workers, who have initiative, are able to make decisions and can hold an overall vision of production processes will adapt poorly to the bureaucratic organisation systems still operated by so many companies. If these companies do not change, they will gradually be swept aside by competitors who are better able to make use of their workers' personal skills. The process might lead to job losses and suffering for the workers of businesses that fall into crisis.

Workers' openness to organisational and functional mobility – which is partly a consequence of technologies – must be accompanied by a new system of guarantees for workers. It is not true that, for the sake of mobility, anything goes, because more multi-skilled workers can more easily get a job in another enterprise and also because, without personal guarantees, there can be no compromise with the enterprise and its production objectives.

The early management of skills, whereby businesses select workers with a good profile of personal skills and offer them opportunities for professional development in the medium and long term, will have to be adopted as a more sensible policy for managing human resources than constantly running to the labour market to find workers with skills that are appropriate to the moment, only to dismiss them when needs change.

The ability to use computers and telecommunications networks is going to be one of the distinctive features of any able worker.

This ability is going to be required in every functional area of an enterprise – planning, production, personnel management, administration and sales.

As we have already said, being able to use information and communications equipment involves not only knowing how to operate the equipment but also, and most importantly, knowing how to improve production processes and customer satisfaction with the aid of accurate information that is rapidly processed and converted into a factor in decision-making.

This ability is going to be especially required of managers, who will have to know how to turn information systems into a strategic factor for the enterprise. They will not need to be computer experts, but they will need to know how to integrate the use of computers in their management tasks.

Those of us who have developed our professional competence without fully integrating skills as computer users already have considerable limitations, and these limitations will become greater in the medium term if we do not bring ourselves up to date.

The relational dimension, social skills, are a fundamental aspect of the new professional competence of those who are or will be working in the information society. Social skills have always been an important component of professional competence in jobs that involve dealing with the public or collaborating with others. The use of ICTs has increased the value of these skills and turned them into a strategic aspect of the new professional competence in many areas of work. The information society depends upon communication, albeit through technological interfaces. Also, many people doing administrative, design, production and maintenance jobs, etc., have been relieved of routine tasks by the use of technologies. The working time thus saved has to be devoted to tasks that are highly relational, such as discussing projects, attending to external or internal clients and negotiating solutions to problems, since technologies have also expanded the range of possible options.

The social skills that the use of technologies is making more necessary are an ability to:

- collaborate and work as part of a team – demand for which is being increased by the use of new groupware. Collaboration may be with other members of the project team, clients, commercial partners or suppliers;
- listen to, and understand, clients' demands;
- present and explain one's own ideas. ICTs make it possible to improve the quality of such presentations with a combination of text, graphics and data;
- negotiate in a context characterised by competition, plurality and divergence.

3.2. New transversal skills

These are the skills that are going to be needed by anyone living and working in the information society, usually irrespective of the functional area occupied within the enterprise or the post held.

These skills are already included in standard occupational job profiles but will become even more common in the future as the use of ICTs becomes increasingly widespread. They are complementary to each individual's practical specialisation and enable people to shift from one function to another within the enterprise, which is also going to become an increasingly transversal organisation. The most important transversal skills are:

- knowledge of (why, for what purpose and how to use) the information and communications equipment available at any given moment, which may serve to improve the efficiency and effectiveness of one's work. Since this equipment is becoming increasingly easy to use, the main requirement here is that people should be sufficiently interested to keep themselves up to date;
- an ability to perform one's work in a client-oriented way, whether the client is internal or external. This means paying attention to the client's needs and demands and thus being able, with the aid of technology, to offer the quickest, most attractive and cheapest solutions;
- an ability to perceive one's work within the framework of the objectives of the entire organisation and, particularly, to have an overall understanding of the production processes in which one is involved. Being able to assess the economic repercussions of one's work is another facet of this holistic vision. Workers also need to be aware of the consequences their actions are going to have for society as a whole;
- an ability constantly to learn about and update one's knowledge of the products one is producing or the services one is offering. This openness to continuous learning refers not only to keeping one's knowledge of technology up-to-date, but also to other areas, such as enterprise culture and objectives, new ways of thinking and working, the new demands of society and clients, etc.;
- an ability to act on one's own initiative and anticipate problems and solutions. These skills go hand-in-hand with adaptability and multi-skilling, which entail not so much knowing everything but rather being able to integrate in various organisational situations;
- the basic social skills mentioned earlier: being able to listen, collaborate and present one's work effectively. Managers will also have to have leadership skills, that is, the ability to motivate others, make compromises and acknowledge the work of people who are working in organisational and production systems that are constantly changing.

The fact that everyone is going to need these transversal skills means that we also have to look at our basic-education and vocational-training systems and at the organisational cultures of companies that do not allow for the development of these skills. The shortage of people with these skills in companies cannot be solved simply by selecting applicants with a higher level of education, since these skills include a very important attitudinal component whose presence can be ensured only if employers offer basic personal and occupational guarantees.

4. New training needs and methods resulting from the widespread use of ICTs in companies and organisations

The widespread use of new technologies in companies and organisations is leading to a change in training needs and content because of the need to develop the occupational skills described above. Similarly, the ways of organising training are changing and new occupational roles are emerging among those responsible for managing training. We shall now take a brief look at these new needs and methods.

4.1. New training needs and content

Because of the development of new occupational skills, new training needs and new content areas are emerging. On the basis of analysis of the training programmes of various major companies in the areas of telecommunications, transport, banking, electricity, electronic products and administration, the following areas have been identified and can be considered to be new, either because they involve new training content or because they are areas that were not previously covered in the type of enterprise in question.

Technological content

In the continuing training programmes analysed, technological content has obvious priority in course lists. There is a great abundance and diversity of supply as regards technological training, with the specific content being linked to the area of specialisation of the individual enterprise. Most training of this kind focuses on new computer programmes for various uses, new digital services and products, the use of communications networks, methods of working with new technologies, computer maintenance, the Internet, etc. The variety of technological content is enormous, particularly in telecommunications companies.

This area of training is going to become increasingly important, because computer products and services are constantly being changed and updated. There is obviously a concomitant need for training programmes to be updated. However, given the variety of content and the impossibility of being up-to-date with everything, the training departments or managers of businesses and public organisations also have to ensure that the training they offer takes account of users' needs. Sometimes, and especially in public administration, users may feel disoriented by being asked to bring themselves up-to-date with the latest computer application when they have not yet consolidated their ability to use basic programs.

Other existing areas of training whose importance is increasing because of their association with transversal skills.

Working methods focusing on total quality have been a major area of interest in the field of training for several years. Training programmes concerning total quality are based on the belief that the client is of central importance and that businesses must seek out methods and techniques to ensure client satisfaction. The importance of training programmes concerning total quality will continue to increase, as will the demand for methodological rigour.

Communications skills, as regards both relations with clients and interaction with others in general. This type of training involves developing people's ability to listen, to manage interpersonal relations and to understand all the variables that influence human relationships, so that they can inspire confidence, reach agreement or share tasks.

The development of personal effectiveness by improving one's perception of oneself is another area of growing interest in the field of training. The aim is to help people to realise their full potential, overcome difficulties at work (especially personal difficulties) and be able to take appropriate action in any situation.

Ways of thinking and behaving. This new training area is linked to the understanding of technological change and innovation. The aim is to promote holistic vision and creative initiative so that people can use appropriate methods to solve problems and monitor the indicators of efficiency and effectiveness in the process.

Enterprise culture, organisation and economy: this is a training area of major significance for all levels of the enterprise, from managers down to assistants. An awareness of the enterprise's objectives, organisation, working methods, business philosophy and situation in the global and European context is vital if people are to understand the information they are handling. Their attitude to their work and their relations with clients will also depend upon this awareness.

Languages are another area of training which, although not new, is of increasing importance, both because of integration in the single currency and the globalisation of markets, and because of the need to be able to handle the information that reaches us via networks.

New training needs, raised partly by technological change, have highlighted the value of these areas in the development of occupational skills.

4.2 New training methods

New technologies also open up huge possibilities as regards training management:

- they make it possible to store, process and transmit enormous quantities of information, which would have been unimaginable using traditional media;
- they facilitate self-teaching, since they allow for interactive, asynchronistic and distance learning, so that workers can choose when, where and at what pace they study;
- they facilitate training in the workplace, since they are a day-to-day tool in the enterprise;
- by using new technologies, people can access the abundance of information stored in databases, which cover virtually every area of knowledge;
- they encourage motivation and attention, by combining voice, images and text;
- they allow for the individualisation of training and assessment in real time.

It is therefore not surprising that training methods are also beginning to change, especially as regards three particular aspects: training practices, the organisation of training programmes and the professional competence of those responsible for training.

Changes in training practices

A little more than a decade ago, computer-assisted teaching made it possible for the pace and place of learning to be adapted to suit the needs of each individual student, though this system was not in general use because of the high costs involved and because of some technical problems.

In the early 1990s, the development of computer technology allowed for new, more sophisticated solutions, such as the CD, CDI and hypertexts, which had a large information-storage capacity, were interactive and readily transportable and which enterprises used successfully in some training programmes. Their use has, however, been limited because of production costs.

Telecommunications have allowed for another fundamental innovation: networked training services, which have made the time and place of training more flexible. Anyone, at any time and in any place, can access a tele-learning service if he/she has the necessary computer equipment, which is now available at reasonable prices. Telecommunications companies already make use of these services. Some universities have training programmes based on this system and have set up virtual training centres. Another innovation, video-conferencing, is also commonly used by companies and training centres.

It would, therefore, be reasonable to say that, at the moment, educational activities are being enriched and made easier by the use of various technological media, which can be combined within a single training programme: virtual training groups, video-conferencing for large groups, transmission of courseware, videotapes, CDs, tele-tutoring, etc.

The role of those responsible for training is changing and becoming more diversified. On the one hand, they have to acquire new professional competence in the areas of both management and technology. People who design training must be aware of the new methods made available by technology and must be able to manage these new methods and assess the cost/benefit ratio of using them. Those who actually impart training must learn new ways of relating to their students, using technology.

On the other hand, the skills required of the various occupational categories, some of them new, who are responsible for training need to be clearly defined:

- training programmers need to have a sound knowledge of the technological media available that can be used within the enterprise and must be able to negotiate with trainees or their representatives;
- trainers must have a clear awareness of new forms of interaction in the classroom, through the network, video-conferencing, etc.;
- tele-tutors, who work through the network and offer personalised, asynchronous tutor-

ing, must have a thorough knowledge of how to use the network for educational purposes;
- designers of multimedia training material must have interdisciplinary skills in, for example, educational practices, technology and graphic design;
- those responsible for educational resources need a broader knowledge, since they are no longer handling only documents and books but are also using videotapes, CDs, diskettes, etc.

Changes in the organisation of training

Organisational methods often depend upon the resources available to the enterprise. Large companies can create training systems with special teaching packages and include a tele-learning system. Small enterprises are more likely to need the help of outside experts or training centres. Some of the organisational methods in current use are:

- training in the classroom, which is the preferred method when the subjects concerned focus on changing attitudes;
- training in the workplace, with the aid of networked courses and tutoring by team leaders;
- networked training, either at home or in the workplace, outside working hours and with tele-tutoring and the support of multimedia resource centres.

Finally, it should be noted that new technologies mean that training can increasingly be provided in the workplace, which also means that a set of requirements needs to be met if this training is to be as effective as possible: adequate computer and telematic media must be available, provision must be made for co-learning or for colleagues to help each other, and the enterprise must recognise this training, both by making time available and by taking it into account in the overall promotion system.

5. Conclusion

New information and communications technologies are unquestionably having an impact on occupational skills and training. They are not, however, the only cause of change, since economic changes and changes in enterprise organisation are also making a considerable impact. Many companies have yet to make the move away from a bureaucratic culture which is required by the new situation and are, therefore, not realising the full potential of new technologies or effectively managing the human element.

From another viewpoint, ICTs have highlighted the fact that the human element and personal and social skills are vital to work in the information society, and if these skills are to be developed, a system of guarantees must be established to give workers a secure vision of the future.

Lastly, we need to remember that, even within companies, access to technologies is subject to profound inequalities and that the developments described above will not happen everywhere in the same way or at the same pace, though the future trend will be in this direction.

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D. Foreseeable developments in occupations and qualifications against the background of new information and communication techniques

Werner Dostal (¹)

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Summary and outlook

New information and communications technologies have had a huge world-wide impact, especially so far as jobs are concerned. About half the workforce in the established industrialised countries is currently employed in jobs mainly concerned with processing information. Growth in services will ensure that the number of such jobs continues to expand up to 2010. Although the possession of computer- and multimedia-related skills and qualifications has become a major factor in the eyes of potential employers, training directed to providing such skills has been subject to considerable delay because it is still not clear how tasks will be allocated under future occupational structures and because available training capacity cannot be expanded rapidly enough.

Distinguishing between core, peripheral and mixed occupations in the field of information technology makes it possible to clarify existing job structures and thus be able to plan and implement appropriate training programmes. Key occupations that are purely computer-related pose particular problems because of the difficulty of determining whether they mainly involve abstract, less structured activities than generally a university or similar qualification calls for or whether they also cover tasks of a more routine and predictable nature which can be performed by (semi-)skilled workers or

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those who have benefited from work-based training of the type provided by an apprenticeship or under the dual system in Germany. As yet these questions still have to be answered. In the meantime the new regulations governing training for IT occupations under the dual system issued in 1997 are an attempt to encourage firms to provide training for computer-related activities in this area as well. Demand for such skills at present and in the foreseeable future is in the main very favourable.

Peripheral occupations, which can also be defined as user occupations, have expanded in terms of both number and job content, although the computer skills they call for tend to fall more under the heading of general knowledge that is, or should be, acquired under the general school system. Midway between the two types of occupation mentioned are mixed occupations which are mainly the product of government job creation measures but make little long-term sense because of the limited degree of professionalism involved.

The growing use and effectiveness of multimedia has paved the way for new, more open forms of working which, as the example of teleworking shows, could well tend to oust the working structures traditional in our industrialised society. This will probably make itself felt in various peripheral segments of the job market and of firms' activities, though a core workforce, albeit limited, should remain in place.

1. Introduction

The current debate on occupations and qualifications is marked by considerable uncertainty and a number of questions are in urgent need of answers. As the information society develops, for example, will the phenomenon of occupation/profession continue to exist? What will be the future role of functional (specific job-related or occupational) and extrafunctional (unspecific key/core) skills? Will rapidly changing jobs become the norm? Will self-employment become the rule? Will there be steady forms of work permitting a settled pattern of life or will things be in a constant state of flux? Will living and working continue to occupy separate compartments or will they become more integrated? What role will be played by teleworking, new and insecure forms of work and part-time employment compared with the normal form of employment as we know it today?

As more and more people become self-employed, the question of occupation or profession and utilising qualifications and skills in appropriately defined activities assumes particular importance. Will the link between vocational training and subsequent work – generally on the basis of employment – that is at present the norm be maintainable as time goes on? As open working structures evolve, will the phenomenon known as occupation acquire another meaning, just as qualifications and skills will no doubt be gained and used in a different manner.

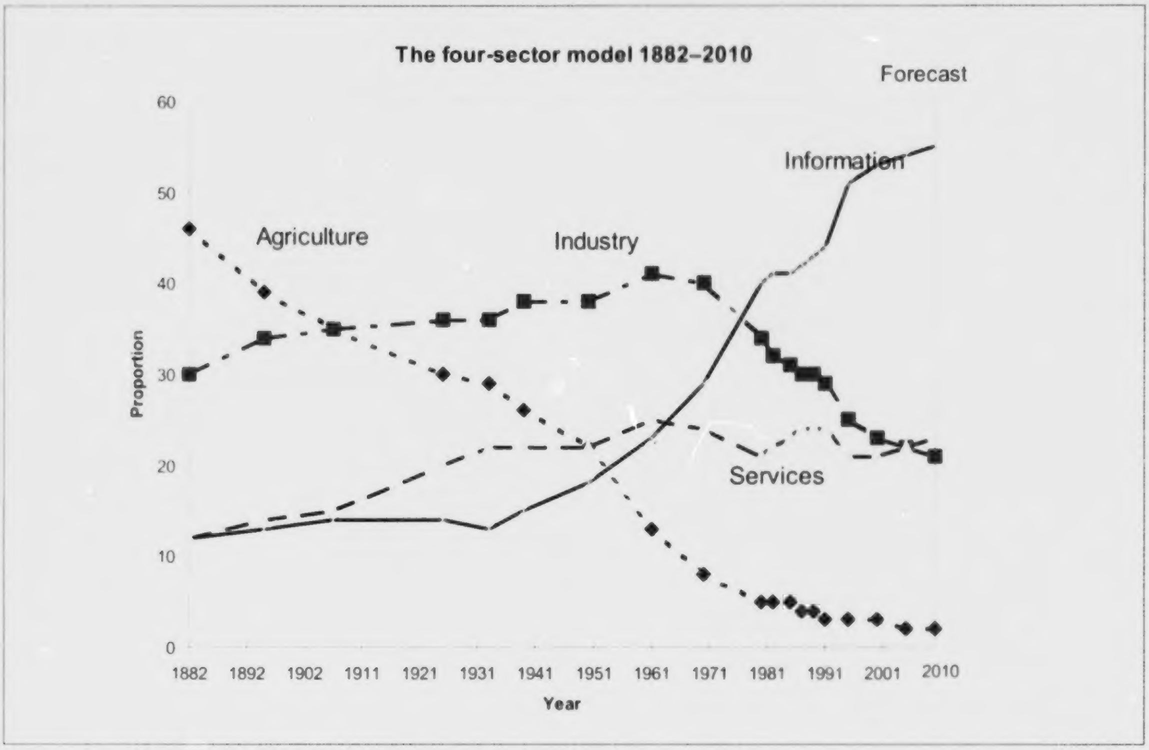
The advent of information technology has brought with it structural, one might even say, revolutionary changes that have duly encompassed Germany and the rest of Europe and which cannot easily be portrayed in conventional terms. Structures have emerged that no longer fit into traditional statistical categories. Concepts to which we have become accustomed, such as the normal form of employment, homogeneous sectors of industry, professions and occupations with a stable content and the normative significance of levels of qualification all seem to be changing and growing less distinct.

The ability of developments in industry and on the labour market to be defined in terms of the 'three-sector model' is increasingly being questioned – this was first done in a publication by Porat in the United States in 1977 – sometimes by reference to a 'four-sector model' (Figure 1). If those employees who are mainly concerned with processing information are taken out of the traditional three sectors and grouped together in a fourth sector the potential developments are interesting (cf. Dostal 1988 and 1995).

As the chart shows, traditional forms of services have generated few additional jobs over the last 50 years, as is borne out, for example, by the non-existence or shrinking availability of personal services to meet day-to-day needs.

The decline in the number of jobs in industry began earlier than is often assumed and was

Figure 1



also far more dramatic. Today only about 25 % of those employed in industry are concerned directly with production.

Despite the growing efficiency of information technology, the proportion of employed people who are mainly concerned with information processing is still on the increase. It is currently about 50 %. This means among other things that growth in the number of jobs in the field of information processing has far outstripped the job losses resulting from rationalisation as information and communications technology has expanded.

Apart from these structural changes in job orientation, what we have come to regard as the normal form of employment would now seem to be dying out. As working becomes more flexible there is no longer any great sense in measuring the volume of work solely in terms of the number of people working. Actual figures tell us very little when, in the absence of any other influencing factors, the range of different forms of working and working times increases and in many cases work-sharing makes two half-time jobs out of one full-time one.

The discussion on the subject of teleworking provoked by modern broad-band communications technology has led to some rethinking. Here it is not merely a case of employment becoming more variable in terms of working times, but also of working location, even going so far as a global distribution of information work. The centralising effect of the steam engine and its successors, which for a long time has determined other working environments stretching even as far as the office, is losing its significance and new structures are emerging whose consequences we cannot yet accurately foresee.

The traditional range of instruments available to economists and social scientists is clearly not sufficient to enable the changes currently under way to be monitored in detail and assessed. A comprehensive interdisciplinary ap-

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proach to the working methods of the future is urgently called for.

This paper will first describe the trends in computer-related occupations and then look at the need structures of employers before embarking on a discussion of possible new forms of working rendered possible by information technology.

2. Trends in computer-related occupations, new occupational profiles and fields

Computer-related occupations naturally have a special role to play in the information society. They are the agents which occupy this area of work and bring about change. It is these occupations that are concerned with the development, creation and application of the relevant technology and thus exercise a considerable influence on other occupational profiles and fields.

Basically there is no clear demarcation between specialists in information and communications technology and the people who use such technology. However, it makes methodological sense to distinguish here between core occupations and peripheral occupations in the IT field. The core occupations will be referred to in this paper as 'IT occupations' and the peripheral occupations as 'user occupations'. Between these two lie what we shall call 'mixed occupations' which do not clearly fall into either category. They are a hangover from the early days of computers before IT occupations had become genuinely professionalised and the new tasks involved were entrusted to specialists in other areas. Because of the limited capacity for IT training these mixed occupations have acquired a far greater significance than originally foreseen.

2.1. Core IT occupations

IT occupations do not simply provoke change but are themselves constantly changing. New technology, new methods of calculation and cost ratios and new forms of organisation are continually generating new kinds of work in information processing which has to be given to someone to do. In principle jobs can be designed on the basis of degree of specialisation and the aggregating of individual tasks and activities. Thus in small IT departments one is liable to find specialists performing a broad range of tasks while in a larger department jobs will tend to be more specialised.

In the early days of computers basically only three types of occupation existed – systems analyst, programmer and computer operator. These traditional core occupations have burgeoned into a large number of variants so that today one can define the following.

Software developer

Software developers have largely taken over from computer programmers. The tasks and tools involved have changed considerably. Whereas at the beginning programs were often designed, written and tested using machine-oriented programming languages, today's software developers work in computer-based production environments, use higher programming languages, and benefit from reusable software packages and the support of efficient systems for the production of documentation. Their tasks are extremely complex and demanding, especially in cases where the software systems available have to be corrected, adapted or otherwise altered instead of an entirely new product being generated. Software developers are today the real core of information processing and will no doubt remain so for the foreseeable future. They frequently specialise in the development either of applications software or systems software.

Database administrators

If computers are to be sensibly used the tasks involved need to be systematically organised and prepared. Systems analysis, as it is known, is nowadays closely concerned with questions of organisation and calls for in-depth analysis and coordination. The result is a concept that constitutes the basis for the installation of hardware and software. Once installation has been effected database administrators are responsible for getting the system working; in other words they introduce the new system and help users to solve any difficulties, particularly at the outset.

Computer support specialists

Subsequently this task is entrusted to people who act as contacts for users. This help may take the form of a hotline via which advice and tips can be given, but there are also assistants who go from one workstation to another and help users to solve their problems. This assistance can be automated using internal or external information networks. With the spreading use of computers at the workplace for almost all types of work and in every sector this form of assistance has grown considerably in importance.

Systems operators

Today's extensive computer networks made up of a variety of elements – computers, cables and workstations are the backbone of firms' information processing and need to be reliable, able if necessary to operate around the clock, and to be brought back into operation quickly in the event of breakdown. Former computer operators have blossomed into specialist systems operators, the complexity of whose tasks generally calls for a high degree of specialisation. Besides operating the network, systems operators are responsible for storing and protecting data and also operate or service databases and information systems.

In addition to these specialised occupations the field of information technology includes a number of occupations concerned with infrastructure. Such jobs are similar in content to those of people working outside the IT field. While there are certain differences due to the particular structures and tasks involved in information technology, the structures of these occupations are basically identical to those in other fields. They include, for example, managers, consultants, researchers, training instructors, marketing and sales personnel and specialist publishers.

The legislation concerned with the individual's right to privacy have given rise to a specific occupation, namely that of **data protection officer**.

Another computer-related occupation is that of **hardware developer,** which is at the interface between engineering and information technology. Here again, the software element is all-important and hardware developers work in close cooperation with their software counterparts.

2.2. Training for core occupations through apprenticeship or the dual system

A university or equivalent qualification is undoubtedly useful for such occupations. The degree of abstraction and complexity of the tasks involved calls for people who have not acquired their skills mainly on the job and perform their work without much reflection but those who have a stable theoretical base to build on and are equipped to convert complex requirements into operable information systems. Consequently, most IT occupations call for a university or equivalent qualification.

However, training courses still exist within the framework of the German apprenticeship or dual system that seek to prepare students for work in the field of communications and information technology (cf. Stiller 1996). The course leading to the qualification of *Datenverarbeitungskaufmann* or business computer operator – the only training course of any length under the dual system specifically aimed at the use of information technology – has not proved very successful since it was introduced in 1969. The number of trainees has remained well below expectations and the number of trainee vacancies offered by firms has been in the region of 2 500 a year – very low compared with the 20 000 vacancies for trainee office-workers. Those obtaining their *Abitur* (A-level equivalent) also had the possibility of training to become a mathematical/technical assistant. But here again the trainee numbers were very low at around 150 a year. This situation, and particularly more recent demands, led in 1997 to the official recognition of new occupations in the IT field (cf. BIBB 1997).

Two years ago the situation and the problems attaching to the business computer operator qualification were looked at by the Federal Institute for Occupational Training (BIBB) and widely publicised. The most important finding was that business computer operators need to shed their technology-centred approach and become more process- and user-oriented. In so doing they will act increasingly as advisers and interpreters for the customer or user. It is safe to assume that there will continue to be demand for business computer operators.' (Schwarz et al. 1996). At the same time, however, the need for new occupational profiles has become clear and the new ones that have been developed will probably in time take over from the business computer operator.

As a result of this reorganisation of IT-related occupations three new occupations have emerged, one of them with two areas of specialisation:

- electronic technician specifically for IT systems,
- IT specialist concerned with systems integration and applications development,
- IT systems operative.

At the same time an IT user occupation emerged, namely

- business IT operative.

The particular feature of these new training programmes is the division of training content into common core competences, which represent the basic qualification, and so-called 'open modules' which constitute the specialist element and constitute about 50 % of overall training. All four training and occupational profiles are based on a common core of IT skills relating to business processes and sectors. They can also be described as the basic or key qualifications for the information technology age. The process-related approach particularly aims to ensure that trainees acquire a holistic grasp of the work involved.

The core competences listed are:

- general occupational competence
- computer skills
- IT English
- commercial skills
- product and systems skills
- project and team skills
- customer orientation.

The open modules included in the training course permit a choice of sector or specialist field from a list that is not yet complete. New items can thus be rapidly included. A standing committee for IT has been created specifically to handle such additions. This allows for the necessary flexibility that was previously lacking under the dual system.

It is gratifying to see that outline conditions ensuring the necessary openness are also being created within the dual system. This will mean that training can now be offered by those firms for whom hitherto the occupation of business computer operator was too rigidly defined. This is expected to generate a large number of additional trainee vacancies – estimates are of 20 000 – and about 4 000 trainees were taken on in the first year, chiefly by firms which hitherto have provided little or no training.

It remains to be seen, however, whether these occupations will prove typical of in-company training. While the number of trainees with an *Abitur* already predominated in the business computer operator courses (64 % of trainees had an *Abitur* qualification and only 4 % came from the *Hauptschule* or lower secondary school and the remainder from the intermediate stage), this should be even more marked in the case of the new IT occupations. These are designed less for those leaving lower secondary school and more as an alternative for pupils with an *Abitur* who wish to gain work experience early on rather than run the risks attaching to a lengthy period of higher education. This is appropriate since those gaining the qualification will find themselves being allocated tasks which do not necessarily call for university or equivalent qualifications. They will probably carry out more routine tasks as support staff rather than tasks involving development and design.

Where those who obtain the new IT qualification will actually end up is something the market will decide. They will probably initially work in jobs previously given to 'back-door entrants', people who have learnt their skills on the job or those who have completed a course at a specialised technical school. The training courses leading to the qualification of business computer operator and mathematical/technical assistant, which still exist, will probably be done away with after a transitional period. However, in the longer run a specialist higher education course will probably also been needed for these areas of activity.

At present such work is mainly done by operatives who have acquired their skills on the job or people with basic training in another field who have gained their computer skills in different ways. Frequently this has been via privately run or public-sector specialist training schools that tend to be concerned more with retraining. The extent and comprehensiveness of basic training courses, whether provided under the dual system or in technical colleges or specialist institutes of higher education, is not nearly sufficient to meet the demand for personnel in the IT field. As a result IT courses have so far remained the principal effective instrument of the government's policy with a very high success rate. To date about 80 % of computer specialists in core and mixed occupations will have obtained their computer-related qualifications by this means. Whether, however, these short and somewhat uncertain training courses will prove effective in the longer term is doubtful.

2.3. Training for core IT occupations

In all about 400 000 people in Germany are employed in computer-related occupations (cf. Dostal 1995, p. 157). In addition there are other people in employment who while possessing qualifications and experience in the computer field are often assigned to other occupational groups. This is either because they possess formal qualifications in another field to which they remain closely bound or because they are in a managerial position. Under the present unidimensional classification of occupations they are recorded with no regard to their actual area of activity.

Of the 400 000 or so computer specialists, 97 300 have a university or equivalent qualification. However – and this can be traced through the genesis of the occupational field – they do not all hold computer qualifications; a large number have qualified in another specialist field. If the 57 800 people holding a university or equivalent IT qualification are questioned as to their present occupation, the result is as follows (data from the 1993 Microcensus): 36 800 people with a diploma in computer sciences are in jobs which qualify as IT occupations whereas 21 000 with the same qualification describe their occupation differently. On the other hand, 60 500 people with a university or equivalent qualification in another field are employed as computer specialists.

Because demand is enormous and computer specialists with a university or equivalent degree are in short supply, would-be employers have looked for alternatives and taken on people with training in another field to do the work required. In designing working structures, the allocation of work, task inventories and job specifications have been so altered by the firms concerned as to be satisfactorily performable by such replacement staff. This substitution takes two forms.

Horizontal substitution: the tasks are performed by people with qualifications at the same level (in this case with a university or equivalent qualification) but in other subjects. In recent years three alternatives have emerged.

1. Employment of people with specialist qualifications related to information technology or who have studied computer science as a subsidiary subject. This may include graduates in mathematics, the natural sciences, electricity/electronics and even economics and the social sciences.

2. Employment of people with qualifications in specialist fields where jobs are difficult to find and who have often been unemployed for some time. They have usually undergone further training or retraining in computer-related fields provided by the Federal Labour Office under the law to promote employment. Such retraining generally takes place at technical college level, although usually in homogeneous groups of graduates.

3. Graduates in various fields who have found employment in computer-related jobs without any additional formal qualification, either because they possess computer skills which they have acquired in privately run courses or by self-teaching or because they have been specifically directed to these tasks by their employer.

Vertical substitution: the tasks are performed by students completing a course at a technical college or specialised vocational school or who have attended a company-run training course, people who have interrupted their training or those without any vocational training. They generally have certain qualifications at their own particular level and in the course of time have acquired further qualifications either as a result of on-the-job training or through courses or other types of training.

From the employers' point of view this type of substitution has proved so useful over the past 25 years that it is still regarded as normal. Even today one hears the comment that people with this background are able to solve computer-related problems far better than trained computer scientists. This is understandable because, as we explained above, job structures in the case of computer users especially are designed more for people who have learned on the job or undergone retraining. To this must be added the fact that a large number of managers who became involved in this work at an early stage have also risen to their present level through this type of substitution. As a result one constantly finds that formally trained computer scientists are only seldom given the chance to develop their potential.

The current trend towards outsourcing of production-related services to smaller firms points to a way out of this unsatisfactory situation. Since computer scientists are unable to find the appropriate type and structure of work in user occupations they are not so efficient and successful. The firm to whom the work is outsourced, on the other hand, has decided to employ IT specialists and can offer them an adequate inventory of tasks without regard to conventional hierarchies, and an environment in which the IT specialists are more able to apply their specific skills. Computer operators who have acquired their skills on the job, on the other hand, do not have the same opportunities with these firms as they do with the users because they do not offer the necessary professional skills.

2.4. Peripheral and mixed occupations

While the distinction between IT specialists and those with skills acquired on the job relates only to the manner in which they have acquired their qualifications, tasks and activities are clearly more or less computer-related: information technology may be a core occupation but may also play merely a peripheral role in the spectrum of tasks and activities.

There is, therefore, little point in attempting a classification on the basis of an employee's proximity to the computer. This opinion was first advanced as long ago as 1970 (Bösenberg and Ganzhorn 1970): specialist knowledge and computer-related knowledge should always occur in a specific mix. Users require only an elementary knowledge of computer science whereas specialists require systems-related knowledge. Between these two groups are the so-called 'mixed occupations' which involve a more specialist-field-related use of computers. This classification of work has sometimes been based on the size of computer involved. In the case of large computers work was considered to be definitely specialised, while medium-sized computers were thought to be used by those in mixed occupations and small computers by those in peripheral occupations. This is how the concepts of core, mixed and peripheral occupations came into being.

This pattern of thinking has marked discussions concerning computer-related occupations over the last 20 years in Germany particularly. However, it is impossible accurately to state the number of employees falling into each of the three categories. If those in core occupations are considered to be people claiming an occupational qualification in the IT field, while peripheral occupations are deemed to be those of people who occasionally use a computer, and the mixed occupations those who mainly use a computer as a tool, then the breakdown for 1991 (Jansen and Stooss 1993) is as follows. The figures in brackets represent forecasts made in 1980 for the year 1990:

Core IT occupations:	1 % of employees	(5 %)
Mixed occupations:	15 % of employees	(20 %)
Peripheral occupations:	21 % of employees	(40 %)

It is, therefore, the mixed occupations who come closest to the forecast while the core occupations – the only ones to be qualified here as computer specialists – fall well short of the prediction, even though this group includes those who have acquired their skills on the job and when questioned described their occupation as core IT.

Those falling under the mixed occupation heading thus usually describe themselves in terms of their traditional, non-computer-related occupations. Such mixed occupations in practice have a good image since there is also a noticeable trend here towards what are known as hybrid occupations. Thus in many industrial or craft training courses subject-matter previously split between a number of occupations is now combined in hybrid occupations such that of the mechanical/electronics technician. University and equivalent courses, such as business computer science, industrial engineering or technical business management are also tending to follow this trend.

Frequently, however, the term 'mixed occupation' is misunderstood because they are also seen as a mixture of specialist qualifications and extra-functional qualifications such as interpersonal skills, negotiating skills, knowledge of languages, ability to respect deadlines, readiness to accept responsibility, ability to organise one's own work etc. But this is not what is meant here. The term 'mixed occupation' is used to designate a mix of different specialist qualifications and activities, hence on the one hand computer-related and on the other specialist fields such as car production, engine construction etc.

This differentiation is also possible in borderline cases. There are hard-working, competent people who are able to combine specialist knowledge at a sufficient depth in a number of fields and hence be professionally successful. This, however, is not the norm since greater breadth usually goes hand in hand with lesser depth. This makes it inadvisable to use such exceptional cases as the basis for personnel planning and training courses, which should be designed for the candidate of average ability and willingness to work.

That extra-functional qualifications such as interpersonal skills, creativity, ability to get things done, thoroughness and possibly modesty, as the list of key qualifications usually runs, are also useful for computer scientists as well as others in computer-related occupations should not be doubted. These qualifications could possibly also be acquired through an appropriately structured curriculum. However, they should not mask the specialist qualifications and they should preferably be acquired during basic schooling and through practical experience in a general environment and less during an occupational or scientific training course whose main objective is to provide thorough specialist qualifications and competence.

2.5. Lessons learnt to date

Computer-related occupational structures are confused and in need of reorganisation so as to provide a clear basis for discussions and planning with well-defined concepts and at the same time to enable efforts to be directed to desirable future structures and orientations. Transparency is helpful even if requirements are liable to alter at very short notice, making corrections frequently necessary.

First of all we need to clarify whether the profession of 'computer scientist' should exist at all, whether it has a sufficiently sound basis and whether it has a place in an optimum classification of work that cannot be undertaken, by people in other occupations, even by way of substitution.

An effort should also be made to estimate how wide a field is covered by the profession, whether it includes only tasks that cannot be carried out by others and which call for people with specialist computer science knowledge or whether some areas of overlap are acceptable in which it is at least possible for computer scientists to do their job competently and with satisfaction. Other occupations also involve such overlaps which people undertake when the core areas of activity are not sufficient to occupy them. But where such areas exist, computer scientists will have to compete with other specialists – an unaccustomed situation as far as they are concerned.

Finally the profession must be rounded. No person choosing an occupation will opt for a confused collection of tasks that cannot somehow be integrated. Computer science as a subject and a science must therefore seek to clarify the subject-matter that constitutes the core of the profession, what may be regarded as a useful extension and what is more of a disturbance and should therefore be eliminated. All established professions – one need only think of engineers, doctors, economists or philologists – are characterised by a rounded set of tasks with some variation at the periphery.

It should be clear that computer science, although comparatively new, is not to be regarded as an applied science that is only temporarily necessary and will lose its significance as computers become increasingly user-friendly. Assuming competent computer development and a use going far beyond their present scope, computer science should be regarded as a science concerned with every aspect of information processing and use. In this sense the field of activity and the potential for computer specialists is far greater than can be defined by the present growth in the use of computers.

With the internationalisation of information processing and its rapidly increasing use specialisation should increase further and a new competition be generated between computer specialists with a variety of different qualifications offering their services on world markets. It has been shown that computer developments achieved by German universities and research institutes and implemented by software and applications firms are very competitive.

In order to make occupational structures more transparent at international level CEPIS (2) has produced the European Informatics Skill Structure (cf. CEPIS 1992, Dostal 1995a). This distinguishes between 40 activities and three to eight levels of competence which are then defined in terms of the initial qualification requirements, tasks and activities and the potential for further development. It is, therefore, a comprehensive compendium. Unfortunately it did not have the desired success and although developed at considerable cost, did not meet with general acceptance. There are various reasons for this, some being its limited practical relevance, the considerable work involved in keeping it up to date and questions regarding its binding nature. Although firms employing a large number of computer specialists particularly need such structures for personnel planning and job design and frequently attempt the task themselves, they usually tend to see it as an internal function that is not generally relevant. However, there are signs that their attitude is changing.

2.6. Qualification structures on the labour market

The principal objective of those undergoing vocational training is to find a job and with it acquire a stable and highly regarded occupational and social position. Top of the prestige and income scale are those professions and occupations requiring university or equivalent qualifications. The State in its capacity of employer has taken over the hierarchies defined in the education system and graduates are recruited at a high level. The dominant position of universities and similar institutions in the education system reflects in the thinking of the general public and of employers. Many higher education courses are tailored to specific professions whose structure and tasks are clearly civil-service-oriented and otherwise have no practical application at all or only if considerably modified. Reference is constantly being made to the importance and role of middle-level training which is highly practice-oriented and in line with market requirements. The dual system of vocational training, for example, is regarded as highly job-related and for this reason alone ideally suited to ensuring a smooth transition from school to the world of work.

However, the situation on the employment market is highly polarised. People without a formal educational qualification run a considerable risk of finding themselves without a job. In 1995 only about 4 % of university graduates and those with similar qualifications were without a job in their field of qualification compared with about 8 % for the workforce as a whole (Figure 2).

When jobs are scarce, people show more interest in open forms of working and new types

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(2) CEPIS: Council of European Professional Informatics Societies.

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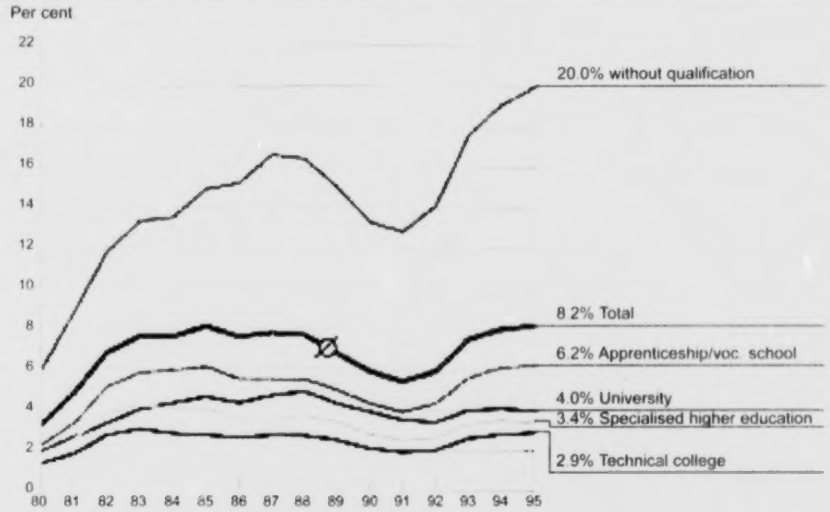
Figure 2: Qualification-related unemployment rates 1980–95 (West Germany)



Unemployed as per cent of all civilians of working age (excluding trainees) with similar qualifications.
Employed persons giving no information as to vocational qualification (Microcensus) spread proportionally over all groups.

Source: own calculations based on unemployment and Microcensus figures

of employment. Self-employment as one such form has long been customary in agriculture and the craft trades and in the highly qualified professions, and has been opted for particularly by people who having undergone further training have qualified as master craftsmen or children of the self-employed able to take over a business or practice.

Even so, most university graduates and similar are at present still employed rather than self-employed. The State, hitherto the main employer for those with higher qualifications, is now losing some ground. People with university and similar qualifications are now increasingly finding jobs in the private sector where they are welcomed: in the 17 years from 1978 to 1995 the number of employed persons with university and similar qualifications in West Germany doubled from two to four million.

However, the problems here are also increasing: firms are tending to confine themselves to their core activities, hierarchies are becoming flatter, and demand for personnel in many areas is falling sharply. The situation is further aggravated by the trend in industry to relocate beyond regional and national frontiers; as globalisation proceeds more demanding jobs are being shifted to countries and regions where the cost of employing people of graduate level is cheaper.

To what extent do advances in information and communications technology and the advent of multimedia and the information society affect the chances of those completing vocational training courses? Is it still possible to gain entry to traditional careers in the civil service and to plan for this? Or can a secure livelihood now only be assured by opting to become self-employed or freelance?

The answer to this question is basically that jobs are becoming more and more demanding and the knowledge and skills of those with high qualifications are very much needed. However, employers are no longer prepared to accept all comers, nor to guarantee those they

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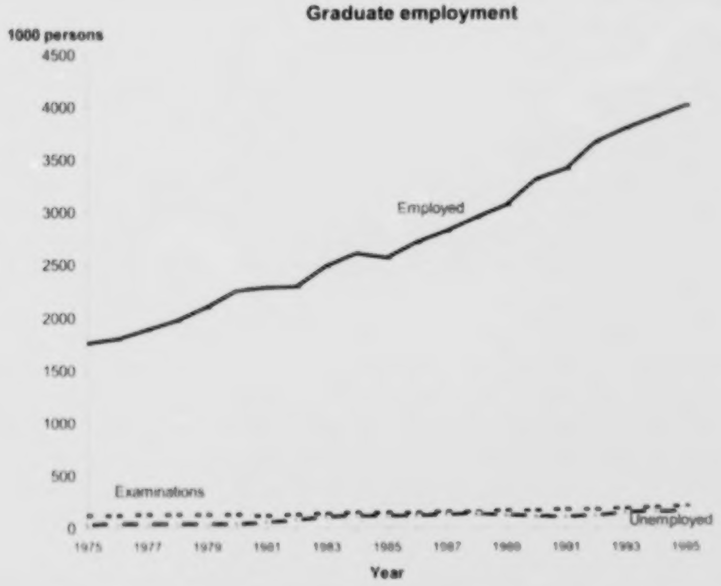
Figure 3



do accept life-long employment. Often jobs are only offered on a temporary and sometimes even only on a freelance basis. Hence the growing importance for people to develop their potential to such an extent as to be able if necessary to become self-employed or freelance in their own country or in other countries and regions.

If we turn to the most suitable subjects in which to specialise the signals from the labour market are contradictory. On the one hand people are needed for specialist tasks even in traditional fields and must be immediately employable. On the other hand employers are looking particularly for additional qualifications while stressing that the area of specialisation is not so important. They claim to prefer motivated people capable of further professional development since specialist tasks are in any case changing rapidly. This can only be understood as meaning that both types of people are needed – specialists for specialist tasks and all-rounders for the infrastructure. Everyone should ask himself where he would feel happier – in a specialist field of activity or in a more managerial or organisational position.

3. Current job situation in the computer field

The number of job vacancies for computer specialists is booming. Multimedia, the need to adapt software as 2000 approaches, an increased need for data security and new applications led to a shortage of qualified people in Germany in 1997 and the first months of 1998. The CeBIT trade fair held in Hanover each year has developed into a occasion for those seeking qualified personnel and a place to make contacts. It was particularly clear this year that it was not only products and services being offered and sought but to a very great extent personnel as well.

3.1. Signals from the United States

A glance across the Atlantic underscores the likelihood of explosive growth. In a new study by the Bureau of Labor Statistics, the American equivalent of Germany's Federal Statistical Office, George T. Silvestri, who has been observing the scene for over 20 years, forecasts that the following occupations will post the most rapid growth in the United States between 1996 and 2006 (Table 1):

Table 1: Expected developments in computer-related jobs in the United States, 1996-2006

Database administrators, computer support specialists, and all other computer scientists	212 000	461 000	+ 118 %
Computer engineers	216 000	451 000	+ 119 %
Systems analysts	506 000	1 025 000	+ 103 %

Figures absolute or per cent

Source: Silvestri 1997, p. 77

At the same time, he states that these jobs will generally call at least for a bachelor's degree from a university or equivalent.

We can expect to see a similar trend in Europe. The market is booming, the demand situation is similar and can hardly be met. In the third quarter of 1997 the number of job vacancies for computer specialists in Germany rose 50 % on the same period of 1996 (cf. Gleiser 1998, p. 19). Because there are not enough computer specialists on the market, companies advertise the posts and continue to be prepared to take on back door entrants, those switching from another field and specialists in related fields.

It is difficult to understand why, while the job market offers few opportunities in many other fields, those taking their *Abitur* and students in higher education are at pains to avoid the computer field. The number of students commencing a course in the computer field fell 2 % between 1995 and 1996 with the decline particularly marked in the case of the specialist institutes of higher education and what are known in Germany as 'Comprehensive universities', while the universities proper posted an increase of some 10 %.

The reasons behind this situation of growing job opportunities but a shrinking number of interested candidates are unclear and complex. For the time being we can only speculate. Computer science is still clearly regarded as a difficult subject with limited prospects of success and only attracts those young people who are willing to put all their effort into a course of study. Failure rates are high, success is uncertain. The same is true once people start work: since computer scientists are in short supply they are put to work where they are indispensable and burdened with difficult and complex tasks, given short deadlines and obliged to work in specialist fields from which they have little chance to escape. They are highly appreciated as specialists and well paid but in the main they remain higher-level specialist staff and only seldom rise to managerial positions within their firm.

Even in business management the number of students beginning a course in computer-related studies is stagnating. Yet it is here that one would expect to find the IT managers of the future with prospects of a secure career. Why are people so slow to choose this subject? Here again, the explanation is hard to find. Could it be that there are not enough university places or is it because some courses are masked by a different title or perhaps some students of business management only decide later to switch to a computer-related course?

Clearly this segment of the labour market is full of contradictions and conflicts of interest. To establish a factual basis we shall look at some up-to-date employment figures which show – for the past at least – a very positive, though in some areas varied trend.

3.2. Developments in the employment market for computer specialists

Computer specialists continue to account for about 1 % of all employed persons. By way of comparison we might mention that there are twice as many engineers and about three times as many teachers. There are some 400 000 people in computer-related jobs, of whom about 80 % are in fixed employment and obliged to pay social security contributions, the rest being civil servants, freelancers or self-employed. The number of freelancers is relatively high and the possibilities for teleworking and open working structures are utilised in this sector more than in others. Whereas in 1993 only 15 % of computer specialists worked freelance or were self-employed, by 1995 the figure had already reached 20 %. Growth is clearly very rapid and is leading to new types of employment with short-term project work and no long-term commitment.

3.3. More jobs for computer professionals

The area of employment open to computer professionals has so far been expanding at about 3 % a year but in 1997 increased by 9 % (Figure 4 and Table 2). After stagnating in 1994 the number of those employed (obliged to pay social security contributions) soared by 29 200.

However, in line with the general economic situation in Germany unemployment among computer specialists rose by about 6 % in 1997 (Table 3). Following a gratifying decline in the figure of almost 5 000 in 1995 and 1996 the absolute number of registered unemployed in the computer field took off again. The increase was particularly noticeable in the eastern part of the country at 18 % compared with only just on 2 % in the west.

The general unemployment rate has now fallen in the western part of Germany and is running at around 6.3 %. In the east it has risen to 19.7 %. In the west it has already dropped below its level of 1993 (Figure 5) though still not as low as in 1991. In eastern Germany unemployment is back at its 1995 level (cf. also Table 4).

Generally speaking, therefore, it would seem safe to say that Germany has put the 1994 recession behind it. There is still demand for computer specialists although the number of unemployed has not decreased in absolute terms. Clearly the job profiles required do not always match those of the candidates applying.

3.4. Growing importance of university-level qualifications

The growing trend of employers to seek people with university-level qualifications for jobs in the computer field is very marked. The number of 'genuine' computer scientists among the total number of people employed in the field has risen sharply. Even so, computer scientists still only account for 20 % of the total and 80 % are specialists from other fields.

The number of those holding university-level qualifications has since 1993 risen from 32.4 % to 34.0 % (Table 5). This is a rapid progression since of the 45 300 computer specialists who obtained jobs in this field since 1993 19 700, thus 43 %, had already completed a university-level course. If we allow for the fact that some people entering the field will have failed to complete a university course, which the market situation still allows, the proportion of highly qualified specialists will be even higher. Those with secondary school or lower qualifications will increasingly be pushed towards the margin of the job market.

On the negative side it is also very clear that of the currently approximately 27 300 unemployed computer specialists only 18 % have a university-level qualification, whereas 82 % have lower and medium-level qualifications. The differences in western and eastern Germany are here surprisingly small: in the west 17.7 % of graduates are registered as unemployed and in the east 17.6 %.

3.5. Women: proportion rises sharply in west, stagnates in east

The proportion of women in employed in the computer field is still low at 24 %. In the west the figure is 22 % and in the east 41 %. The formal educational level of women employed in computer-related occupations is lower than in the case of men. In all, 24 % of women have a university-level qualification compared with 37 % in the case of men. However, in absolute terms the number of women employed in computer-related jobs in Germany increased sharply between 1996 and 1997 – by 12 500 in the west and by 1 200 in the east. Women, therefore, have seized the opportunities that certainly exist and have established themselves more firmly in this field. The unemployment rate for women in the computer field declined between 1996 and 1997 from 6.8 % to 5.5 % in the west of the country but rose slightly from 25.4 % to 26.1 % in the east.

However, this trend goes hand in hand with a decline in the level of women's formal qualifications. The number with university-level qualifications has dropped 2.4 %. One may assume that new types of jobs are emerging here and that women are tending to take on more assistant and subordinate jobs.

3.6. Consolidation and structural change

The job situation in the computer field is thus characterised by a combination of structural change and shrinkage. Although the importance of IT specialists is increasing, the number of those currently completing training in Germany (at present about 4 000 computer science and 1 200 business computer science students a year) is enough to cover under 20 % of the 30 000 or so new jobs being created each year. Consequently 80 % of jobs will continue to be taken by back-door entrants, those promoted or those switching from other occupational fields.

In the longer term those with university-level qualifications will account for about 35–40 % of employees in the computer field, with half holding a qualification in computer science and the other half in other related fields. The variety of sourcing will therefore be maintained with all the advantages this brings in terms of interdisciplinary skills and all the disadvantages of inadequate professionalism. The new information technology training provided under the dual system will enable medium-level specialists and middle managers to acquire a basic training which should ease their path into higher specialist jobs. People without a formal qualification will continue to find openings in this field, although the proportion is likely to decrease from its present level of around 6 %.

Generally speaking, however, qualification requirements tend to alter rapidly, so that people will need to pursue their further training very intensively. Rising unemployment coupled with a substantial number of job vacancies is only explainable by the fact that many applicants are not able to provide the qualifications asked for.

Overall the number of jobs available for computer specialists should post an increase. Just as in the United States, the number of jobs in areas concerned with information processing, thus in the secondary service sector, are expected to increase substantially in Germany by 2010. This is an area where computer specialists with appropriate qualifications are urgently needed. Given people with the necessary qualifications and aptitude computer science proper as a professional training and study objective should come to the fore.

Figure 4: Computer specialists in fixed employment (liable to pay social security contributions)

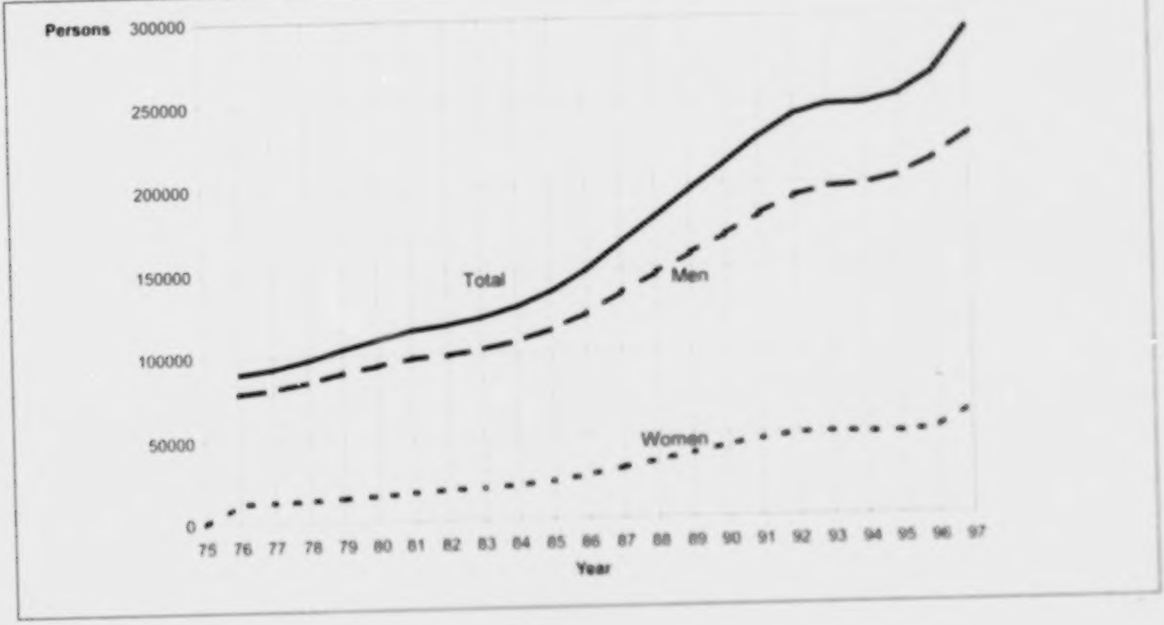


Figure 5: Unemployment among computer specialists in western Germany

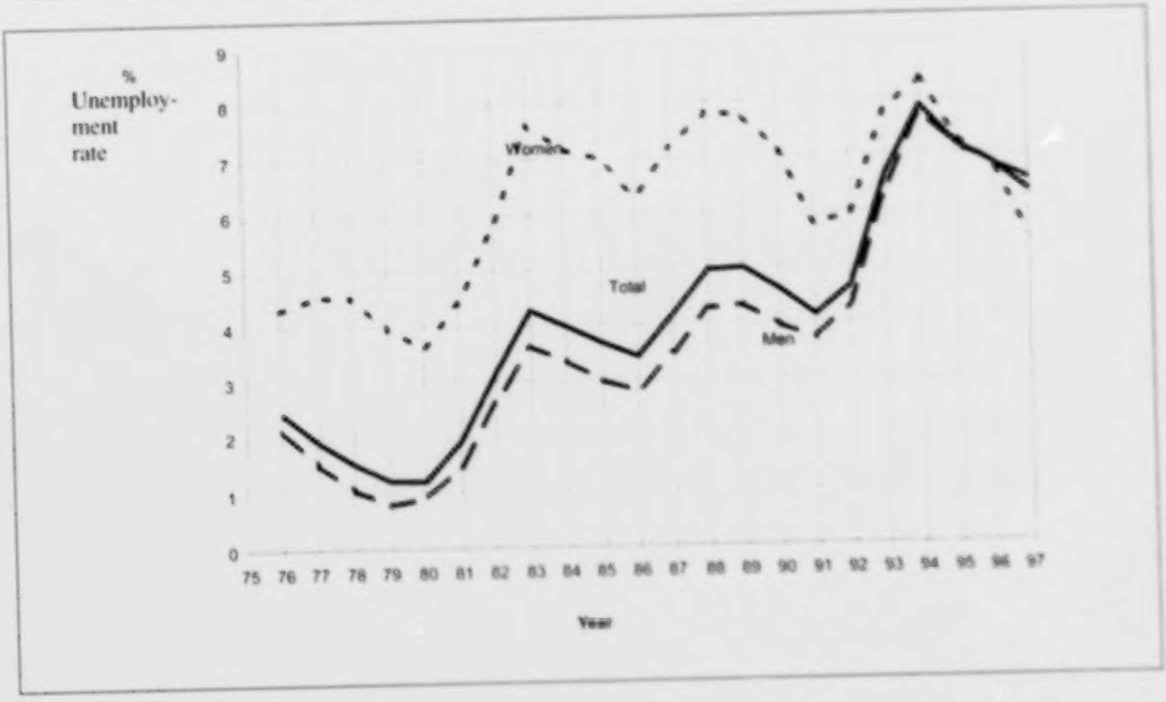


Table 2: Trend in the number of computer specialists employed 1996–97

1997	Men	Women	Total
West Germany	227 649	63 563	291 185
East Germany	18 385	12 883	31 268
Total	246 034	76 419	322 453
Absolute change 1996–97			
West Germany	+ 14 675	+ 12 500	+ 27 175
East Germany	+ 814	+ 1 191	+ 2 005
Total	+ 15 489	+ 13 691	+ 29 180
Percentage change 1995–96			
West Germany	+ 6.4 %	+ 19.7 %	+ 4.9 %
East Germany	+ 4.5 %	+ 10.2 %	+ 4.2 %
Total	+ 6.3 %	+ 17.9 %	+ 9.0 %

Source: Employment statistics as at 30 June 1996 and 1997.

Table 3: Unemployment among computer specialists 1996–97

1997	Men	Women	Total
West Germany	15 930	3 699	19 629
East Germany	3 146	4 542	7 688
Total	19 076	8 241	27 317
Absolute change 1996–97			
West Germany	+ 339	– 8	+ 331
East Germany	+ 589	+ 565	+ 1 154
Total	+ 928	+ 557	+ 1 485
Percentage change 1996–97			
West Germany	+ 2.2 %	– 0.2 %	+ 1.7 %
East Germany	+ 23.0 %	+ 14.2 %	+ 17.7 %
Total	+ 5.1 %	+ 7.2 %	+ 5.7 %

Source: ST4 as at 30 September 1996 and 1997.

Table 4: Employment and unemployment in the computer field

Year	Employed	Unemployment rate in per cent			
		Unemployed	West	East	Total
1993	277 200	28 000	6.6	25.1	9.2
1994	275 700	30 200	7.9	23.8	9.9
1995	280 200	26 500	7.2	19.7	8.6
1996	293 300	25 800	6.8	18.3	8.1
1997	322 500	27 300	6.3	19.7	7.8

Source: *Employed: employment figures at 30 June each year.*

Unemployed: *Federal Labour Office ST4 at 30 September (Figures rounded).*

Table 5: Qualification structure in computer-related occupations

Year	1993	1997
Men with university-level qualification	73 200	91 000
Percentage	34.1 %	37.0 %
Women with university-level qualification	16 700	18 600
Percentage	26.7 %	24.3 %
Total computer specialists with university level qualification	89 900	109 600
Proportion	32.4 %	34.0 %

Source: Employment figures at 30 June each year

3.7. Multimedia

Multimedia involves the integration of all forms of media for the gathering, storage and transmitting of data. Different media existed in the past in the form of newspapers and radio and different jobs came into being with a variety of specialist occupations and very different means of entry.

Multimedia is nowadays highly computerised. Newspapers are produced using computers, radio and television utilise computers. At present we are experiencing a period of innovation with the emergence of new media, new services and new tasks that are possible only thanks to computers and their enormous variety which is too hard to grasp. The next few years will bring more new and innovative products onto the market. The trend can be summarised in three words:

- computerisation
- internationalisation
- individualisation.

Internet, Intranet, World Wide Web and other new telecommunications media and their interlinking with traditional personal computers, television and telephones etc. dominate discussions. Specialists are needed to develop these systems, produce them, operate them and maintain them. Basically one can distinguish between two job areas calling for very different qualifications.

On the one hand **computer science specialists** are needed to create the infrastructure, install it and maintain it. These are computer specialists with additional telecommunications skills able to handle images as well as sound. This occupational group requires a sound basis of computer science preferably acquired at university level. The complexity and abstraction of the tasks they have to perform can best be carried out by people with a sound theoretical basis.

At the same time there is a need for **specialists** to cope with **content**, to gather data, analyse it, order it and convert it. This occupational group requires the conventional skills of journalists, editors, teachers and other specialists tending more to the humanities. The means of entry to such jobs vary considerably. However, the last few years have shown that, here again, the qualifications demanded are becoming higher and a university-level qualification is now the rule.

At present traditional basic education does not turn out sufficient multimedia specialists. It is up to the government through its employment policy to provide additional training and courses leading to specific qualifications in order to help computer specialists and those more concerned with content to adjust their qualifications to the requirements of multimedia and to permit closer cooperation between specialists in different fields. Computer scientists, for example, should know more about data content and its conversion while those concerned with content should recognise the possibilities offered by the technology and also its limits. The all-rounders so often desired will not exist. The results of occupational research show very clearly that in the multimedia field, as elsewhere, work will be divided between different occupational categories with a clear distinction between computer science and content or data processing.

The enormous challenge to the labour market as a whole lies in the twofold trend towards individualisation and internationalisation. Multimedia can be produced and used without limitations as to place. This means that the occupations in this field will also be more mobile and more individualised. Many tasks, particularly in the case of content-processing, are already performed by freelancers operating internationally. Multimedia therefore will also make for new working structures with the risk of the current normal form of employment as we still know it disappearing. We shall have, therefore, to evolve new forms of working which are stable and socially acceptable and meet the special requirements of multimedia within a generally changing working environment.

4. General and foreseeable trends in occupational profiles

The German Institute for Employment Research (IAB) in collaboration with Prognos AG has repeatedly attempted to assess the future employment situation. A new projection by Prognos is now available describing the changes in activity to be expected up to 2010 (Prognos AG 1998). However, this projection still needs to be supplemented by a sectoral projection which will be produced by the IAB in the autumn of 1998 as part of the model calculations being undertaken there. In parallel with this Prognos has prepared a projection of qualifications that will be completed in the next few months.

Prognos is taking 1985–95 as its reference period (1991–95 for the eastern part of Germany) and making projections for 2010. In so doing it differentiates between the western and eastern parts of Germany and between full-time and part-time jobs. The employment trends are influenced by external factors which, roughly, are:

- changes in production technology and organisation;
- the gathering pace of service activities and increasing use of information;
- changes in the socioeconomic environment.

The likely proportions of jobs are then computed by a complex estimation process. For a number of years now the focus has intentionally been not on the occupations but the actual activities involved, because it has been felt that these will mirror changes more clearly than more complex occupations which – as occupational research has shown time and again – are quite capable of absorbing new contents and rejecting old ones without any need for a denominational change.

The results are activity profiles which show that the trend towards secondary services that has been under way for some time is continuing, although at an evolutionary rather than a revolutionary pace and hence at one that is manageable (Table 6).

Of course the study is far more detailed and differentiates within the various activities mentioned between further activities, showing the changes in a total of 37 sectors for both east and west Germany and full and part-time employment. We shall not go into this in greater depth here. The predominant trends mentioned by the authors in their more detailed differentiation are:

- the trend in ancillary activities is not uniform, and declines in some segments go hand in hand with likely rises in others;
- the specialist element in production activities is on the increase;
- a shift from industrial to craft production is under way;
- repairing and setting up/adjusting machines is on the decline;
- research and development activities are becoming increasingly important;
- production-oriented services show a contradictory trend of expansion and decline;
- organisation and management will gain considerably in importance;
- personal services show both expansion and stagnation but overall the trend is negative.

The future working landscape will be marked not just by these global trends but also by the

Table 6: Projection of activities by Prognos AG 1998

Persons mainly involved in the activities mentioned as a percentage of the total workforce

Germany overall, full-time and part-time, sectoral structure as 1995

	Actual 1995 %	Projection 2010 %	Change %
Production-oriented activities	30.7	28.4	– 7.5
Setting up/adjusting machines	7.2	6.9	– 4.2
Extracting/producing	16.9	15.4	– 8.9
Repairing	6.6	6.1	– 7.6
Primary services	43.0	42.2	– 1.9
Trading	11.4	12.5	+ 9.7
Office work	17.4	17.0	– 2.3
General services	14.2	12.7	– 10.6
Secondary services	26.3	29.5	+ 12.2
Research and development	5.0	5.5	+ 10.0
Organisation and management	6.7	8.8	+ 31.3
Caring, advising, teaching, etc.	14.6	15.2	+ 4.1

Source: Weidig, I., Hofer, P. and Wolff, H., 'Arbeitslandschaft der Zukunft. Quantitative Projektion der Tätigkeiten', *Beiträge zur Arbeitsmarkt- und Berufsforschung 213*, Nuremberg, 1998, p. 127.

change in personal working time. According to the forecasters the various types of activity differ in their suitability for part-time working. Thus, activities such as:

- setting up and adjusting machines;
- extracting and producing;
- repairing;
- management;

are not really suitable for part-time working. The percentage of people in these jobs on part-time is small and will remain so. On the other hand, percentages are very high in the case of:

- trading;
- office work;
- general services;
- caring, advising, teaching, publishing etc.

We may expect that in future the percentage of those working part-time in the case of trade and activities such as caring, advising, teaching etc. will grow far more rapidly than that of full-timers. In the case of office work, in particular simple office work, and organisation and management the significance of part-time work should if anything decline.

However, the trends described are not satisfactory indicators in that they are not entirely clear and uncontradictory. Although in principle certain activities are more suited to part-time working than others due, for example, to their lesser complexity or the fact that they do not require any specific know-how or intensive training, this is sometimes balanced out by factors such as the high cost of training in connection with repair work as technology changes rapidly, or the problem of achieving high machine running times with part-time rather than full-time employees. Then again, the trend is also influenced by the fact that demand for part-time work varies from one sector to another.

The results of such calculations must be interpreted with caution. We have described the method in detail in order to make clear that calculations are based on trend computations taking account of expert opinions as to probable and likely future developments. What actually happens may turn out quite differently from the forecast and such projections can be taken only as a general guide.

5. New forms of employment and how they are spreading

A consideration of the need for skills and qualifications in the light of new developments in information and communications technology would be incomplete were one to ignore the tendency for jobs to disappear with consequences particularly as regards extra-functional qualifications. The signs here are of considerable change that is already becoming visible in IT-related areas of activity.

5.1. Multimedia as the trigger and means for creating new forms of work

The tendency for traditional forms of work, generally evolved in industry, to disappear is currently the subject of considerable discussion (cf. Miegel and Wahl 1996, 1997; Giarini and Liedtke 1998; Senghaas-Knobloch 1998, Ullrich 1993 and many others). Even so, despite all the signs of softening, the standard working relationship continues to be the norm in our society. However, it is steadily losing ground as growing flexibility in terms of status and working time has considerably increased the number of alternatives and of individual arrangements. Employment today is far more multifaceted than in the old industrial society and this cannot fail to generate changes in all other areas of our life.

Work as such can no longer be so clearly defined. A great many activities with employment-like characteristics exist between the two poles of leisure and recreation and gainful employment and are becoming increasingly important in our society. Their significance becomes clear *inter alia* because when people are questioned as to use of time they refer more to unpaid than to paid work. Today records of gainful work obviously reflect only a part of the work which people do; more work is being done within informal structures. This means that we must rethink our understanding of work, as also of professionalism and deprofessionalisation. The accelerating and expanding use of information technology and multimedia is designed to reinforce this trend.

Multimedia especially permits and facilitates decoupling in terms both of time and space. If nowadays people are able to call up all the information they require using their computer and if they can communicate using the appropriate terminals even with images and voice there is, at least functionally, no real need for colleagues, superiors or employees all to be in the same place at the same time in order directly to interact.

Such possibilities have been discussed for the past 20 years and are referred to as teleworking. Teleworking involves work carried out using telecommunications facilities. Thus all workers using telecommunications in their work are also teleworkers. A narrower definition covers only those employees who utilise telecommunications to give them more flexibility as to location and who thus mainly work outside the traditional fixed place of work. One form is home working, when employees work from home and are linked to their employer or customer via a multimedia system. A distinction is made between permanent and occasional teleworking. Teleworking has many aspects which are seldom discussed.

However, the idea that teleworking could be introduced while all other aspects and phenomena accompanying traditional employment are retained is an illusion and is likely to prove acceptable only for a transitional period. Working locations outside the firm that have already been realised in some places through general negotiated agreements and specific company agreements are, because of the additional equipment and telecommunications costs involved, economical only where the teleworkers are in a particularly strong and privileged negotiating position. They may be specialists possessing qualifications in short supply or who provide special services where the cost factor is only secondary. Normal work will be possible by teleworking only when the costs of teleworking are either the same as or less than location-bound work. Nowadays this will be the case only when working costs are cheaper than the additional communications costs and the teleworkers provide their own equipment. Moreover, the possibility of the teleworker returning to the central location at any time must be ruled out so as not to oblige employers to keep unused office space available. However, intermediate forms of working exist where the workplaces are no longer individualised but pooled and kept available only for those who genuinely work within the firm.

New types of job will arise in the context of teleworking but will have little in common with current forms of employment. They will be network-oriented, their content and performance will depend on orders and contracts and the necessary working time will merely be a guide, not a determining criterion. The traditional workplace will then cease to exist. Counting and categorising will become obsolete. Quantifying and effectively controlling the work carried out on the basis of such orders will generally be very difficult.

These new forms of working will for some considerable time exist in parallel with traditional, location-bound employment. The opening-up of working structures to produce a society in which people work more or less independently, and the shift in social references away from the job within a firm to other areas of life, will still take some time. We may assume that people who have become accustomed to working at a fixed place with all its associated compulsions and protection will not find it easy to adapt and that it will mainly be younger people starting out on their careers who see teleworking and other open forms of work as a genuine alternative to fixed employment, while older people will tend to reject them.

In such a situation older employees will not easily move from their place of work and younger people will find a normal working vacancy only in exceptional cases. Alternatives such as open teleworking will then be accepted as an emergency solution. However, as things develop it could well be that given the appropriate links to the world of work and society teleworking appears perfectly attractive, as the assessments of people interested in teleworking clearly show. The more that stable jobs are done away with, the more likely it is that open forms of working will be considered, and in due course they will become a feature of our society.

Teleworking, therefore, is a variant that questions the system of gainful employment with employers and employees to which we have become accustomed and shows clearly that new forms of working with or without a predominant use of telecommunications are emerging. We would be well advised to use the short time still available in order to design teleworking and other open forms of work acceptably.

This detailed discussion of teleworking shows that although appropriate for specific types of work, it is unlikely to become very widespread. Two trends are identifiable here: on the one hand there will undoubtedly still be sensitive tasks that can only be carried out by core workforces within a firm to which they are linked and under the necessary supervision. At the same time a further separation of information-related work will create new forms of self-employment and shift volumes of work out of the traditional working structure. Teleworking could therefore be a limited transitional phenomenon that will later be ousted by other as yet unknown forms of work.

5.2. Gaining qualifications and employment in open forms of work

Influenced by the traditional system of employment in the civil service where the level of educational qualification determines the entry level and future career, people at present tend to expect that their job level in other areas of employment will also be determined by their formal qualification. In practice, however, there are signs that this is changing and that primary importance is attached to their immediate employability for specific types of work. An analysis of unemployment rates for the various levels of qualification shows that while this rule applies to job security in general, the hierarchies within the employment system are becoming increasingly decoupled from those of the education system. When it comes to finding a job, people who have completed a practically oriented course of training at a specialised technical school or specialised college of higher education are often better placed than university graduates or those with similar qualifications.

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If the positions achieved in working life are set against the formal qualifications held, the disparities emerge. While those with university or similar qualifications have a reasonable chance of reaching senior or managerial positions, people without a professional qualification who would generally not be expected to be found in such positions in large numbers prove to represent 20 % of the total men and 10 % of the total women in senior positions. This would indicate that the link between formal qualification and position within a firm is not so rigid as is generally thought, and could well be much looser when the next generation comes to seek work, since the civil service no longer has such a great demand for highly qualified graduates and new innovative firms often recruit candidates in an unconventional manner. Furthermore, formal qualifications are not always so important for success in self-employment as when seeking a permanent job in larger firms or the civil service.

This could mean that in future, jobs in core workforces are gained less on the basis of educational level and more on the basis of employability and suitability for integration of the individuals concerned. The element of personality then becomes decisive and this cannot easily be developed by specialised vocational training alone. It is even possible for abilities inherent in a person to be wasted by vocational training. All this should be borne in mind when considering the calls for a generalisation of curricula and vocational training content.

5.3. Segmentation in employment and qualifications?

The partly contradictory trends – greater specialisation contrasting with a more global, less differentiated structure of demand – can best be explained by the 'segmentation' approach. We shall look at segmentation into core and peripheral workforces, the core workforce (B) being situated at a higher level by virtue of its status, if a unidimensional assessment of status is at all permissible (Figure 6).

Segment B can be broken down further:

- On the one hand there are employees whose activity is heavily focused on the firm (B 1) and who can be put to work wherever they are needed. They will be working for the firm for a longer period and must possess a high degree of occupational flexibility since the firm will have to react rapidly to new markets and demands. A broad basic qualification and comprehensive extra-functional qualifications will be supplemented only peripherally by specific specialist qualifications as they become necessary.
- On the other hand there are employees with a specific specialist focus who – at a time in which the company's other assets such as land, buildings and means of production or infrastructure are rented or leased – constitute the actual core value of the firm (B2). In them the company possesses a high degree of professionalism that is very valuable. Firms are responsible for the skill-building and adaptation of their core workforces. Older employers will be assigned to appropriate workplaces until they reach retirement age. Whether a trend to early retirement will emerge will depend on the situation in each individual firm and beyond.

Segment A shows a particularly high degree of professional specialisation and the gap will continue to widen. However, it will be at the expense of job security. In this segment, working structures will be open, and networks, virtual firms and teleworking will become the rule. Most people will be working as freelancers or be self-employed. Those concerned will obtain the necessary further qualifications by their own efforts and at their own expense. These will particularly involve detailed specialist qualifications; while the qualifications needed to integrate and market these skills will also be of relevance, this in turn can be entrusted to other service providers. Older people will also find opportunities in these open working structures if they are able to offer irreplaceable specialist qualifications and the necessary flexibility. For them there will be no retirement age and they will be able to work to a higher age – as is already the case of architects of international repute, orchestra conductors etc.

For the peripheral workforces (C) professionalism and job security go by the board. Any qualification – where it is needed at all – will be the responsibility of, and funded by, public-sector bodies such as local authorities, the Ministry of

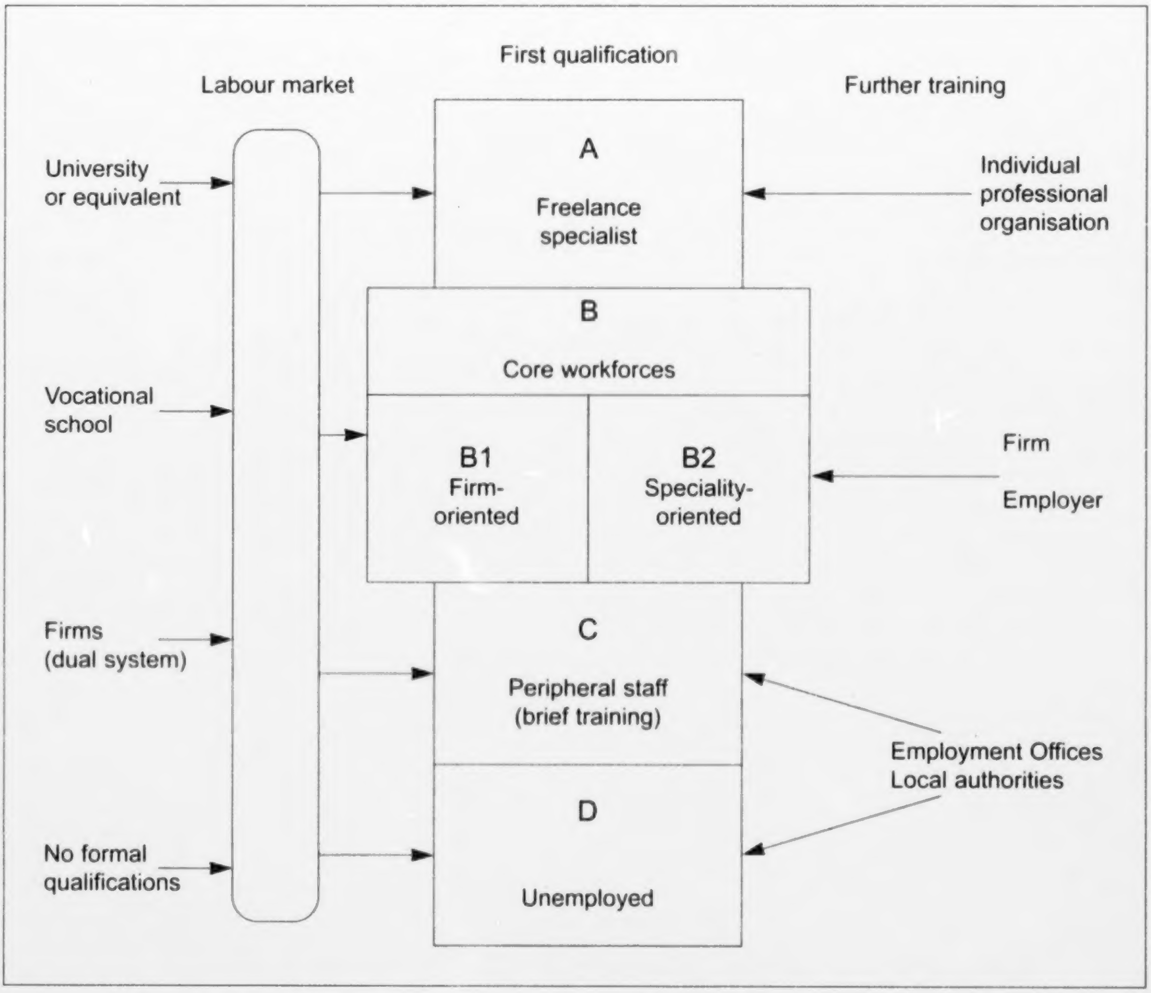
Labour etc. Qualifications will be confined to skills currently in demand and any sound theoretical basis will be lacking. Older people will have a chance in this segment only if they are able to sell their work at a low price, as in the case of today's healthy pensioners who work for employers without the need for additional social security.

This leaves segment D, the unemployed whose return to gainful employment will be the concern of specialist bodies as in the case of C.

The switch out of the various levels of qualification into these various status levels will take place via the labour market, which will tend to prefer formally higher qualifications. In many cases, however, it will be guided by market forces where formal qualification is only one of several factors.

The traditional pattern whereby people in employment begin their career with vocational training, after which the firm or employer concerned ensures that employees' qualifications are brought into line with changing requirements will not survive. In future employers will undertake this responsibility only for their core workforces. The peripheral workforces will have to supply their own, generally lower qualifications and will have to rely for this on further training given, for example, by the Ministry of Labour or local authorities. Freelancers will themselves have to ensure that their qualifications are adapted as necessary and will be given help by their professional associations and craft guilds.

Figure 6: Qualification and access to different employment levels


First qualification
Labour market
Further training
University or equivalent
Vocational school
Firms (dual system)
No formal qualifications
A
Freelance specialist
B
Core workforces
B1
Firm-oriented
B2
Speciality-oriented
C
Peripheral staff (brief training)
D
Unemployed
Individual professional organisation
Firm
Employer
Employment Offices
Local authorities

5.4. Attitudes of existing employees and job-seekers

Job expectations change over time. When a job becomes enriched with additional tasks it acquires a value of its own. The job has then become to a certain degree independent and is made up of a combination of status indicators, social integration and security. It guarantees a regular income, and possibly also reduced complexity, and often shields the person concerned from an everyday life that has become very uncertain. Recent surveys show this to be reflected in the opinions of those questioned. If they are asked what aspects of their working life are important it is not 'interesting work', 'scope to use one's own initiative' or 'useful to society' that are mentioned first but job security, pleasant colleagues and pay – all aspects which apart from job security can also be found in open forms of working and self-employment and in many cases also alongside or outside actual work.

This means that the workplace as a framework for one's existence in society has acquired a significance that goes well beyond its actual functional role in the economy. As the normal form of employment begins to disintegrate, these various extra elements become available, since all new forms of work are restricted to the core element of actual work with any additional needs expected to be met elsewhere. In other words gainful work will once again be pared down to its core.

These revolutionary changes are taking place slowly. Secure jobs still exist and will continue to do so. However, the trend towards open forms of working is recognisable and it is clear that these changes will be mulled over especially by people whose access to steady, secure jobs is blocked. In this connection it is encouraging that in a recent survey in which people were questioned about the status they were aiming for, over half those questioned said that they wished to become self-employed. Whether because of a lack of jobs or out of a genuine desire, younger people would seem to be ready to embrace these new forms of work. This shows that younger generations will accept the changed working conditions and even consciously shape them to their advantage so that they become acceptable and bearable for society.

6. Conclusions and recommendations

The following main conclusions emerge from what has been said:

- The way in which work will be divided up in future is still not clear. A wide range of mixed and peripheral occupations exists, the qualifications for which have not yet been clearly laid down. Because of the present high demand for more people with computer skills the tendency towards a greater professionalism in core occupations will if anything tend to slow down. As a result more people will acquire their qualifications through informal channels. For those seeking jobs and training this offers an opportunity, since access to jobs in this field is possible even by way of retraining. For the field of activity itself and especially planning of training courses it poses a problem, since professionalisation is taking place slowly and in a contradictory manner.

- The rapid advance of multimedia has compressed two occupational fields into one, although a distinction can still be made between computer specialists also involved in media technology and those concerned with processing data content, such as journalists, designers etc. Here one can continue to expect activities to be clearly demarcated with growing cooperation thanks to the relevant additional qualifications. Only with a clear demarcation of this kind can one provide clear advice to those embarking on a course of training or seeking a job and offer appropriate training courses at every level. Computer-related occupations and content-related occupations can hardly be combined because they call for completely different aptitudes and preferences.

- Current forecasts show a trend towards secondary production-related services which, however, are becoming increasingly insecure because they are unable sufficiently to anticipate the trend towards greater flexibility or the consequences of new occupational divisions or combinations. However, findings with regard to formal qualifications are clear: secondary service occupations largely call for a high level of qualification and favour specialists with a particular ability to design and organise.

- Finally the advent of innovative information and communications technology threatens to destroy traditional forms of working that emerged with the industrial society. These risks can be avoided without great difficulty. Coping with open forms of working and organisation makes new demands in terms of independence and qualifications that will have to be included in future training models. The necessary legislative and social provision still has to be created.

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E. The structuring of vocational qualifications in France and Germany: institutional coordination systems

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Summary and outlook

The structuring of vocational training qualifications is proving to be an excellent indicator of major issues that are common to the 'varieties' of modern capitalism (Hancké and Soskice 1997) exemplified by German and French society. It concerns in fact not only the structure of the education system but also the production of skills and abilities, the regulation of the labour market, particularly as regards young people, and, more generally, the functioning of the labour relations system.

At a time when employment is in permanent crisis and the production system is undergoing precipitous and often chaotic change, can the certification of vocational training still provide the necessary public reference points for those involved in the training/employment relationship at its various levels – multi-industry, sectoral and micro-economic? The debate is evidently topical, since it concerns the effectiveness of institutional regulations as compared with the market-oriented regulation that prevails in the Anglo-Saxon countries. Comparison between Germany and France is enlightening in this respect, since it involves two very different conceptions of the foundations of institutions, of the rules and regulations and of the public asset represented by, for example, vocational training: in Germany, the private sector plays a decisive role whereas, in France, the supremacy of the public authorities (both national and regional) is strongly affirmed.

The process of designing qualifications thus implies a considerable coordination effort involving both economic and social agents. Two elements of this process are taken up here in order to review the basic elements peculiar to each country and their respective ability to engender or adapt to economic and social change: the designing and negotiation of certification take place in a public arena that pits institutions and individuals against each other, according to the logic that prevails in each country; they define a public asset whose purpose and meaning vary considerably from one society to another.

1. Vocational qualifications and the public arena

In both Germany and France, the creation of vocational qualifications involves the three major partners – the public authorities, employers' organisations and the trade unions; but the content of this tripartite relationship varies considerably, depending on the role that each of these partners plays in the process. Furthermore, the dynamics within this arena have a powerful impact not only on the partners' behaviour but also on their make-up, which is more differentiated than is suggested by the similarity of their official titles, and particularly by the use of the term 'social partners'. Of course, in both France and Germany, the creation of qualifications may be compared with the creation, by collective agreement, of a labour market rule of procedure. The purpose of this rule and, therefore, its scope and the undertakings it implies for the parties involved differ considerably, however.

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In the case of France, the partners' involvement is framed within a hierarchical model in which the social partners are consulted without having any decision-making powers; in Germany, the quest for a 'common law' involves them in the process as negotiators. The status and role of experts are deeply influenced by this. This does not mean, however, that we have a clear-cut division into imposition and compromise: in both systems, there is agreement among the various parties involved as regards the basis of the institutional process.

1.1. Germany: tripartite negotiation

According to the model of interpretation used by Hilbert J. et al. (1990), the organisation of vocational training in Germany is based on a system of regulation that rests on action by 'private governments', comprising employers, trade unions and chambers, to which the State delegates management of this public asset. This constitutes a middle route between State management and management by the market or, more precisely, a combination of the two to form a subtle compromise: partners from each sector develop 'joint regulation' (Reynaud and Reynaud 1994) by working to define, via a single process, both the content of in-house training and the type of skills thus produced, whilst acting within the framework of federal legislation and the market regulation of the supply of training places. Furthermore, production of this public asset comes down to a private entity, the enterprise, which is also its main user.

The term 'private government' clearly reflects the ambivalence of the situation in Germany, which implies a twofold coordination – between public and private choices on the one hand, and between collective undertakings (at sectoral level) and individual commitment (at enterprise level) on the other. The Federal State is also involved in the process, since it guarantees the smooth functioning of the entire system, in accordance with the original 1969 law on vocational training. Should private agents fail to take action, the Federal State is not only legally entitled to take direct action but is actually obliged to do so, in accordance with the principle of subsidiarity.

A combination of social and economic interests at micro- and macroeconomic level

The debate on the content of vocational training in Germany is closely bound up with the expression of collective and individual interests: the trade unions want training to be broadened to promote the occupational autonomy of trained apprentices, while employers advocate training that can be put to immediate use in a narrower field. This means that the structure of training is often the end product of a long process of social compromise. This process of negotiation to define an occupational skill – comprising both training and a way of exercising an occupation – thus lays down an 'occupational law'.

The establishment of this negotiated compromise may be the end product of conflicts that might be all the more serious in that the compromise covers not only the content of training but also pay conditions within the enterprise (cost of training, trainees' pay, definition of a trained person, etc.). This overlapping of the sectoral and the microeconomic is also at the root of a subtle combination of institutional regulation and the play of market forces. The rules and regulations governing training must take account of enterprises' 'willingness' and 'ability' to provide training (Koch 1997), since enterprises are not bound by any obligation undertaken in this respect by their representatives at sectoral level, especially given that the only requirement under official regulations is that they provide training for young people under the age of 18.

Willingness to provide training varies enormously, depending on economic activity, enterprise and period (Lutz 1992). It is inseparable from an actual ability effectively to implement the common rule, the 'occupational law' represented by the rules and regulations governing training, which is not a rigid framework or simple constraint that might lead microeconomic agents – particularly heads of enterprises and, even more so, heads of small enterprises – to refuse to participate in creating a public asset. This gives us a better understanding of two major features of the way in which the certificates issued under the dual system in Germany are constructed: the highly procedural nature of the process and the system's adaptability to specific practical contexts.

Complexity of the procedure and common 'weighting' of the interests at play

Often referred to only indirectly, the principle of consensus concerns first and foremost the procedure for drawing up the rules and regulations governing in-house training. An initial decisive step is taken when the social partners agree that it would be appropriate to begin a process of reform in a particular sector. It may be very difficult to reach such agreement, not only because of union–employer conflict but also because of considerable differences of opinion among the various employers' organisations involved, and the broader vocational training becomes, as has been the dominant trend over the past 15 years, the greater the number and diversity of employers' organisations involved. At this stage of the procedure, both employers' organisations and trade unions have a right of veto that the Federal State can unilaterally remove only at the major risk of altering the economy of the system and sooner or later causing a shift to State regulation.

Yet the State is not inactive: it may encourage the reaching of agreement by acting in its role as facilitator and guarantor of the process. In particular, it can rely on the specialised resources provided by the Federal Institute of Vocational Training, which may be decisive: the Institute's experts may simply follow the mediation process or 'substantially' intervene in it, by making suggestions concerning the vocational skills and qualifications that seem pertinent to them. In brief, the aim of this procedure, in which the State is involved, at the very minimum, in a 'supervisory' role, is to ensure a balancing of all the interests at play.

The 1969 law was highly innovative in this respect. Training in the form of apprenticeships did exist prior to this law, but within the framework of a much more unilateral system, since only the employers' side could initiate reform and determine the rules and regulations governing training (Koch 1997). The new legal provisions gave the Federal State a major role, which it then, in accordance with the spirit of a contractual economy based on the equal power of the parties involved, delegated to the social partners. Of course, employers' associations, which are essentially sectoral structures, play an important and often central role (Soskice 1996), but they must take real account of trade union positions. The trade unions serve, at the very least, as a genuine counter-force.

'Dual' certification thus necessarily reflects this shared vision – reached by force of compromise – of what vocational skills and qualifications should be, and its official recognition reflects its status as a sort of 'joint product' of a system based on conflict and consensus. For all these reasons, it may be argued (Silvestre 1987) that a certificate acquired under the dual system signifies entry into a 'community'. In this case, it is a community governed by clearly stipulated rules and regulations and not, at least in principle, by customary practices and purely local relations. One might almost speak of an 'industrial community' based on formal rules and regulations that thus give rise to a shared conception of this public asset (Verdier 1996). The (potential) lengthiness of the procedure makes it possible to use a 'profit-sharing system' for building this public asset, because of the many interactions it permits among the parties (cf. Eymard-Duvernay 1995). Expert intervention is a very important aid in this cognitive process, which depends upon a dynamic of collective learning (Favereau 1995). Furthermore, the process does not stop with the drawing-up of the rules and regulations governing in-house training and the adoption of framework programmes to be implemented by teaching establishments.

'The common law': a framework for multiple interpretations?

This occupational law should not be seen as a rigid framework or, even more importantly, as a constraint; quite the contrary, since it can and must be subject to various interpretations, depending on where and under what conditions it is being applied. For example, the rules and regulations define some minimum standards that leave a considerable margin for manoeuvre, depending on the nature and potential of the training enterprise. The fact that the most general rules and regulations can integrate the specific features of individual contexts of application in their underlying principle is a decisive factor in creating an institutional process that thus escapes being either a constraint (which often becomes inoperative) or an incitement (which often leads to windfall effects) and can therefore give rise to genuine undertakings (cf. Salais and Storper 1993). Genuine undertakings can be made, in particular, because each agent involved can give a meaning to this 'common law' that accords with his respective approaches. Enterprises' choices are not neutral because, within a given occupation governed by a single 'law', there will be significant differences based on reputation: for example, it is a well-known fact that an engineer trained in a small metal-processing enterprise will not have benefited from the training programmes, educational tools and managerial methods available to an apprentice at Siemens. They will nonetheless belong to the same profession, which may be decisive in the event of external mobility.

The flexibility of the combination of specific and general may even go a step further. The 'flexibility clause' allows an enterprise to choose not to implement the framework training plan, provided it can justify that choice. The situation engendered by hierarchical impositions or the law of the marketplace seems far removed from the principles that govern the construction of the German certification system. Legitimacy is created by the pertinence of the arguments invoked and of the analyses that underlie them.

Force of rules and regulations and 'complementarity' of the partnership system

The scope of the rules and regulations drawn up within the framework of the negotiation of 'dual' certificates is likewise closely associated with the fact that the parties involved in this 'system of coordination' work together in partnership. As described by Méhaut (1997), the rules and regulations do not simply govern a 'product' whose value would be assessed later in accordance with the operation of the market, as in the case of industrial standards. The negotiated compromise's scope, in terms of time and space, is determined by the undertakings of several agents, primarily at federal level with the involvement of the 'major' sectoral agents. However, the microeconomic level is also involved in two ways:

- as a point of reference, since enterprises' interests and potential undertakings are explicitly taken into account when the impact of the content of new training regulations on their individual 'willingness' and 'ability' to provide training is being assessed;
- as an interested party, since training regulations, within the limits of the 'flexibility clause', must be respected by employers, who will have to deal with workers' representatives. The effectiveness of the compromise between adaptability and the need to guarantee a minimum quality depends on this.

Three forms of internal checks are used to enforce 'joint regulation': Betriebsräte (establishment-level works councils), which monitor respect of the training conditions laid down by law and of the training content laid down under the framework plan; chambers, which are monitoring bodies appointed by law; and examinations, involving tests that bear mainly on the training content delivered by enterprises and which are approved by a tripartite committee, comprising representatives of employers, workers and trainers. Without this system, the effective application of minimum standards would be constantly under doubt and there would be a risk of those standards becoming merely formal, unless they were monitored by a special body – an arrangement that would not be very compatible with the principle of autonomy inferred by the predominance of 'private government'. Confidence in the basic quality of the vocational training defined by this institutional system ensures that it remains sufficiently attractive to young people and is a sign of credibility for the enterprises that employ them.

Indeed, the outstanding feature of the German institutional system is its reticulate nature, which ensures that it is adaptable to specific contexts and, at the same time, makes it possible (or, at least, has made it possible up to now) to maintain a compromise between highly institutionalised regulation and market forces. This is why some of the common interpretations of the institutionalisation of vocational training for young Germans need to be balanced against reality.

- On the one hand, use of the term 'neo-corporatist' to define the dual system (Streeck W. et al., 1987) suggests the predominance and even the exclusivity of a centralised encounter between the social partners. Although procedural and substantive rules and regulations are initially drawn up at this level, they are not implemented until explicit account has been taken of microeconomic interests (enterprises' willingness and ability to provide training), of employers' and workers' essential involvement in defining in-house training arrangements and of the employer's responsibility before the Betriebsrat. Also, arrangements for candidates sitting the final examination to be assessed by tripartite committees set up by chambers may be adapted to the specific features of the local enterprise fabric of the sector concerned.

- On the other hand, the designing of vocational training is part of an essentially decentralised system, as attested by the federal nature of the German State and, in particular, by the fact that education is an area governed by the *Länder*. This argument gains all the more force if we point to the actual existence of a combination of training and work, which promotes practical coordination of the inevitable 'general and specific' aspects of any vocational training process. Although not entirely insignificant, since the *Länder* are involved in the 'construction process' via the intermediary of their representatives on the commissions responsible for drawing up educational framework programmes, the regional level does not play a truly decisive role in setting standards.

Thus, via a procedure that allows for the relatively explicit consideration of economic and social interests at both national and local level, the German system actually succeeds in dealing, at least partially, with some very delicate issues:

- how does one go about setting up training that is sufficiently pertinent to all enterprises without too closely mirroring current trends in production organisations?

- and how does one coordinate decisions concerning quantity (consideration of enterprises' willingness and ability to provide training) and quality (guaranteeing respect for standards)?

1.2. France: tripartite consultation

In France, the State, which is omnipresent as regards both the structuring of qualifications and the provision of training, also strives to mirror people's demands in any reforms it undertakes and justifies its pre-eminence by taking account of these demands and framing them in terms of the public interest.

In the reform of the procedure for designing vocational qualifications, which began in 1983, the premises are similar to those that prevailed in Germany in 1969. Here too, the aim is to break with the policy of going along with employers' demands concerning qualifications – a policy that led, in the 1970s, to excessive Balkanisation of the French system and qualifications that were too highly specific (Fourcade et al. 1992). In fact, the French reform will result in an institutional configuration that is very different from German tripartite negotiation. In brief, the processes of reform are more unilateral in France, being instigated either by the State or by powerful employers' organisations. The role of the trade unions is less evident (Fourcade, op. cit.).

Principle of consultation and rationalisation of State action

The procedure for designing qualifications has been radically reorganised to give greater power to the Commissions Professionnelles Consultatives (CPC – Occupational Consultation Committees), the consultation bodies that were set up after the war, at a time when the professions were directly involved in funding and organising vocational training. Of tripartite composition (public authorities, employers and workers – plus experts), these committees must be consulted before any reform of a vocational qualification. Also, their function in terms of putting forward proposals concerning the relationship between training and employment has been significantly increased: their responsibilities in this area are considerable, since their opinions on plans for reform potentially concern more than 600 qualifications at levels 3 to 5.

The very significant rise in unemployment levels among young people completing short vocational courses (*CAP – Certificat d'aptitude professionnelle*, and *BEP – Brevet d'enseignement professionnel*) in the early 1980s (more than 40 % still being unemployed nine months after completing their studies) and a concern to improve vocational education, particularly by focusing on developing combined training and work, have led the authorities to re-establish the social partners' powers of negotiation. The French version of the tripartite relationship reflects governments' growing wish to share political responsibilities that have become increasingly heavy with the rise in unemployment, and youth unemployment in particular, and thereby to improve the internal effectiveness of their policies. The introduction of the new *baccalauréats professionels* (*Bac Pro* – vocational secondary-education qualifications) is a mark of this wish to re-animate the system with links between the national education ministry and the professions. It is important immediately to note the ambiguity of this alliance: by giving preference to a structural adjustment, that is, by creating new qualifications rather than simply reforming existing ones, this approach necessarily places in the forefront not 'private governments', which take action by delegation, but the central State, which is responsible for creating new national qualifications and grades. This means that, in practice, the actual role of consultation will be far more limited than is being claimed.

In fact, a real 'qualification production technology' is being set up under the aegis of the national education authorities. This rationalisation rests on two pillars: the Secrétariat Général des CPC de la Direction des Lycées et Collèges (CPC Secretariat-General of the Directorate for Schools and Colleges), which is particularly responsible for the design process, and the Inspection Générale (Inspectorate-General), which is responsible for ensuring the disciplinary pertinence of vocational qualifications and, therefore, the content of frames of reference (see below).

The Secrétariat Général des CPC is attempting to develop a genuine policy on qualifications that will make it possible to include individual changes in far-reaching action to improve vocational education and set up, in each major occupational field, qualification routes (from the *Certificat d'aptitude professionnelle* (CAP) to the *Brevet de technicien supérieur* (BTS), via *baccalauréats professionnels et technologiques*) that are intended to be coherent (Tanguy 1991). In particular, the Secrétariat Général des CPC is responsible for the research phase that precedes the introduction of a specific qualification, deciding how to pursue a demand expressed by a given sector, whether to launch a study of the justification of this demand, and what further action is to be taken. The Secrétariat Général des CPC also has the power to launch a reform process (which means we are far removed from the principle that prevails in Germany, where only the social partners can judge the appropriateness of a reform).

Original pre-eminence of State initiative

The principle of consultation, which calls for greater involvement of the social partners in the various stages of designing qualifications, has been somewhat disrupted by the political voluntarism that has prevailed in the launching of *baccalauréats professionnels*.

Political urgency will be all the more pressing in that, in these circumstances, the effects of publicity depend upon the declaration of quantitative objectives. Pillet's account (1995) of the opening of the first *Bac Pro* departments is an example (3). Thus it could be tempting, though not necessary, to disrupt the official consultation procedures in the name of the political requirements of the moment, which may sit uncomfortably with the lengthiness of the debates. As Padioleau (1994) points out, 'a number of public actions smack of a "coup d'Etat"', most particularly in France.

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(3) Pillet recounts that a telex sent to vice-chancellors by the minister in June 1985 stressed that the first three diplomas of this kind would have to be available in at least 50 vocational-education establishments by the beginning of the term following the announcement of the creation of '*baccalauréats professionnels*'.

Moreover, when we look at the launching of some of the *baccalauréats professionnels*, it emerges that the plenary meetings of the CPCs were not officially notified of the creation of a new qualification until several months after the decision had actually been taken. Of course, tripartite working parties had been set up in advance, but this method ultimately 'moves the feasibility debate away from the social arena set up for this purpose and shifts it to discussion bodies that include experts on the issues being discussed but do not offer any guarantee of representing the points of view of the various social partners' (Pillet, op. cit.). Indeed, it is a surreptitious move away from the principle of discussion or even negotiation and towards a mere 'notification to the CPC of work done' (of which the creation of the *baccalauréat professionnel* in 'maintenance of office and telematic networks' is an example).

In brief, it is tempting to argue that the ministry's actions regularly come down to a delicate balancing of the need for a genuine consultation process to involve the social partners in responsibilities whose weight makes it advisable that they be shared, and a voluntarism that demands rapid decision-making to deal with political 'urgency' but makes consultation procedures even more of a formality. The paradox of this situation is that it amounts to developing State regulation of vocational training on the basis of referents that are constructed using diagnoses concerning, on the one hand, young people's situation on the labour market and, on the other, anticipation of what work and work organisation might be in the medium term (see below).

Such emergency management is rapidly effective, since the 'willingness and ability to provide training', whose importance we have noted in our study of the situation in Germany, is, in principle, guaranteed by an education system that involves private partners in only a minor way, expecting them mainly to provide the training places needed to set up combined work and training under the education system. It is this partitioning of public action and microeconomic decisions that has enabled the public authorities in France, more than in any other OECD country, to develop, in unison, both general education and vocational training, just as they were able to do in the 1980s. Paradoxically, this non-complementarity of the system of agents and the way in which qualifications are designed outside the labour market guarantee the effectiveness of the voluntarist production of new training programmes. The valuing of these new training programmes on the labour market is the main, if not always the sole, prerogative of the rule of market forces, with all the subsequent risks of devaluation and downgrading that are typical of this method of operation.

A public policy subject to outside influences

Public action is, however, more than this interaction of up-stream (State regulation) and down-stream (the market). Two other important components also come into play: employers' organisations at sectoral level and social demand.

As in Germany, the social partners' involvement is officially structured, essentially at sectoral level. In practice, their involvement takes the form of influencing State decisions rather than direct involvement in establishing rules and regulations, as in Germany. This difference is explained not only by the voluntarist method of public intervention in France but also by the actual make-up of the partners at sectoral level. First and foremost, mention needs to be made of the relative weakness of the trade unions, particularly as regards training issues, which have long been under the remit of the teaching unions and members of CPCs.

Furthermore, given that control of the process has been held by the offices and inspectorates of the national education system, employers' organisations at sectoral level have been led to develop a method of intervention whereby they make suggestions, proposals or demands but are not directly involved in decision-making.

This means that, although they have been involved in designing qualifications, these organisations do not have any primary responsibility for the situation of young people with those qualifications on the labour market. For example, the Union des Industries Métallurgiques et Minières (UIMM – Union of Mining and Metal-Processing Industries) actually called for the creation of level 4 vocational training back in 1984, but responsibility for translating this demand into a *baccalauréat professionnel* was given to the national education authorities, which extended the principle to all the sectors and occupational areas on their own initiative, sometimes despite the reservations of employers' federations, as in the case of the construction industry.

Only sectors such as the plastics-processing industry (Cadet 1996), whose identity has partially depended on the creation of national qualifications in its areas of specialisation, have managed to develop a system similar to the joint-regulation system in Germany: this system makes it possible to coordinate quite closely the design of qualifications, (relative) control of the flow of qualified trainees and recognition of qualifications on the labour market. However, it should be pointed out that, despite the fact that the trade unions played a significant role, the essential partnership for sectoral regulation comprised the employers' organisation and the national education authorities (Direction des Lycées et Collèges and Inspection Générale). Whatever the sectoral configuration, however, the fact is that an employers' organisation with sufficient determination and resources can, without too much difficulty, demand and secure the creation of a national qualification. This possibility is even open to individual enterprises, provided they are large enough – Renault, for example, prompted the creation of a *CAP d'exploitant industriel* (industrial operator's certificate of professional competence) (cf. Bouyx 1997).

Unlike in Germany, the expression of social demand carries considerable weight in the French system for creating and reforming qualifications. Obviously, this dimension is explicitly connected to the hierarchies of levels and types of knowledge that structure the French education system. It is manifested in two ways: ways of pursuing studies in the framework of a given discipline and/or towards a general training; the preferred choice of occupational specialisations, given their greater closeness to general training – this means their regulation may be completely free of any link with enterprises and employers' organisations and of strictly occupational objectives, as in the case, for example, of the *baccalauréat professionnel* in office systems (cf. Bel et al., 1996). Furthermore, the public system tries to relay the demands of individuals through the reforms it undertakes. The expression of this social demand from families is more difficult to identify in the German process of creating qualifications, since the debate bears more directly on economic issues.

A 'government of experts'?

Significant in both France and Germany, the role played by experts differs quite considerably. In Germany, experts are mediators and facilitators in the process: subordinate to the debate between the German social partners, the expert recommendations of the federal institute for vocational training – the BIBB – may even be rejected by the social partners if they are too far removed from the realities of in-house training (Hilbert et al., 1990). In France, the experts, mainly within the public administration, are of prime importance, serving to legitimate the decisions made at two stages of the process (Ourtau 1997): determining the appropriateness of reforms (Secrétariat Général des CPC), and constructing frames of reference (Inspection Générale de l'Education Nationale).

In France, the debate focuses more directly on technical and pedagogical issues (Liaroutzos 1997), but the arguments put forward by those involved will vary considerably, depending on the source of the demand for the creation of a particular qualification (initiative of the education authorities, demand from a powerful employers' organisation, agreement and compromise between two groups of employers, etc.). Moreover, in France, consideration of qualifications must necessarily include a disciplinary logic (from the CAP to the BTS for a single area of specialisation), which means that the institutional process is all the more complicated, since the demand for a level of training equal to or higher than *baccalauréat* may involve more of an identity issue for the occupation concerned than a demand for skills at the level in question (Ourtau 1997).

In brief, public experts are far more influential in France, because rationalisation of the process of creating qualifications has ultimately consisted of setting up an 'expert authority', in this case the Secrétariat Général des CPC with its 20 or so researchers. It is, therefore, able to link political arguments (the management of relations with sectoral organisations) closely to a purely technical register (the 'coherence' of policy on qualifications).

With a more or less partnership-type relationship with the Inspection Générale, the Secrétariat Général des CPC draws on both internal and external expertise to decide – either by gathering all the pertinent information before making decisions or by using studies as a means of retrospective legitimisation – upon delicate issues which are, in Germany, dealt with by 'private governments': defining vocational training that combines feasibility for enterprises with workers' occupational autonomy; reconciling the interests of the trade unions and employers' organisations and, even more, those of different employers' organisations when several of them have an interest in a given qualification; and finally, regulating the flow of qualified trainees, which can create a powerful tension between the recognition of qualifications and the ability to meet 'social demand'.

2. Vocational qualifications and approaches to standardisation

The fact that French and German vocational qualifications are national and standardised is one of the strong points underlying the initial comparison. However, to declare a similarity between the two processes for creating qualifications simply because of this common principle without analysing its object and scope would be unwise. These two dimensions actually confer a unique form on the national standard produced in each case: more rigid in France but centred on certification, it is more flexible in Germany whilst still covering an entire process, from training to the definition of skills.

This, then, raises the question of how close the approaches to standardising qualifications are, depending on how much weight is given to the similarity of their underlying principle and the specificity of their object. Although vocational qualifications in both countries share the same twin anchorages – in the educational system and in the production system – the nature and utilisation of French and German qualifications clearly differ. A comparison that recognises this duality, as identified by Méhaut (1997), also calls into question the assumption that a vocational qualification is a standard that is internal to the education system and external to the labour market (4).

Qualification or skill?

A vital initial difference concerns the nature of the standard constructed. The terms used speak for themselves: in France, we talk of a *diplôme* (diploma); in Germany, we talk of *Ausbildungsberuf* (learning an occupation).

In France, the first step is to create a frame of reference for certification, whatever the method of preparation: institutional education, apprenticeship or continuing training. 'It is a question of defining not a training programme but the skills to be tested in an examination' (Bouyx 1997). This certification does not correspond to a particular occupation but rather to an occupational level or 'vocational target'. French vocational qualifications have another, equally important objective: the pursuit of further studies, according to a disciplinary approach (Kirsch 1997).

In Germany, the main aim is to set up a frame of reference for training that corresponds to a central method of acquiring knowledge and skills (combined training and work), according to a process of gradual specialisation based on a broad base of knowledge in a particular field, including initial work experience (Article 1 of the law on vocational training). Certification validates knowledge and abilities that enable the holder to undertake skilled work in a range of jobs. It should also serve as a springboard for access to higher skill levels (technician, master craftsman, etc.) via continuing vocational training (Kuda 1997). Finally, German qualifications are not designed to lead to further studies.

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(4) Of the elements that come together to shape the dual system in Germany, it is worth remembering that the main locus of preparation is the enterprise, that young apprentices have the status of employed people, and that the assessment criteria governing the awarding of a qualification are based mainly on theoretical and practical skills, with the teaching provided by vocational training institutions being assessed only at the final examination, which takes place in the chambers.

In both Germany and France, vocational qualifications are not designed to correspond strictly to a particular job: in France, the focus is on a level of mastery in a specific area (see the examples given in the annex) whereas, in Germany, the focus is on an occupation (*Berufskonzept)*, defined as a structured, indivisible and unique combination of occupational skills (Koch 1997). The choice of titles for qualifications reflects this difference in approach: the German 'industrial engineer – technical option' corresponds to the French '*baccalauréat professionnel* – maintenance of automated systems'.

In Germany, the field of qualifications is relatively homogeneous. Apart from a few cases of validation at two levels (*Stufenausbildung*), a single qualification covers training in a given area of specialisation. Certificates are nonetheless subject to a kind of hierarchy, obeying a logic that is more horizontal than vertical, since it is based on the occupation concerned (5). The diversity of French qualification categories (*CAP, BEP, Bac Pro, Brevet de technicien, Brevet professionnel, Baccalauréat technologique, BTS*, etc.), and particularly the many levels with which they are associated, makes delimitation of the field more subtle. In this respect, comparison makes it possible to identify a paradox: the growth in the number of vocational qualifications in all training specialisations in France – from 583 in 1969 to 753 in 1995 (Kirsch, op. cit.) – even though they correspond to a broader view than in the past. By contrast, the number of qualifications in Germany is tending to fall – from more than 600 in the 1970s to 370 in the late 1990s – whilst still corresponding to a more traditional view of the link with a particular occupation.

The frame of reference: optimum or minimum standard

In France, the very concept of a frame of reference determines an educational and occupational optimum which tends to form a closed system, whereas German training regulations set minimum standards that allow for greater flexibility in the practical application of training content. Several factors help to explain these differences in concept.

Since the main agent responsible for providing training in Germany is the enterprise, the frame of reference must necessarily provide for a whole range of different situations, depending on the nature and size of the training enterprise. By comparison, vocational-training establishments, which are the main training providers in France, can offer more standardised training.

Also, the greater weight of theoretical teaching in France, together with the fact that the model of 'leading major enterprise' makes the design of vocational training more standardised, means that the threshold is placed very high when frames of reference are designed, since a qualification offers the possibility of pursuing studies to a higher level.

Finally, French frames of reference are based on a relatively abstract and unitary definition of the objectives being pursued. This reflects the 'centripetal tendency of technical education: a unitary ideology whose purpose is to use logic to efface the specific features of techniques'

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(5) According to a typology suggested by Burkart Lutz (1992), we can, for example, distinguish:
- the 'higher categories', which bring together, on the one hand, administrative and commercial training (commercial agent in banking, insurance, industry, export), offering good career prospects and followed mainly by those who have passed their *Abitur* (equivalent of 'A' levels in the UK), and, on the other, industry-based vocational training (metal-processing, electronics, etc), which give access to a skill area encompassing, with certified continuing training, the supervisory level and a good proportion of technical and engineering posts;
- the 'intermediate categories', that is, training in services and the caring professions, as well as technical training (plumbing, vehicle repairs, electrician), which structure the occupational markets of small traders, characterised by horizontal mobility but poor prospects in terms of upward social mobility;
- the 'lower categories', comprising training in the retail trade, hairdressing, etc. as well as training in traditional crafts (catering, timber, etc).

(Deforge 1991, quoted in Marquette 1997). The fact that frames of reference accord less space to execution tasks than to functions such as management or maintenance obviously derives from a particular interpretation of the development of work (Veneau 1997), but it probably also reflects a wish to raise the status of vocational training by ennobling the functions involved and the skills associated with them (see example in the annex).

By comparison, the description of the objectives of German training – both in general terms (training profile) and as regards detailed content (framework plan) – refers to more practical knowledge and skills, even though the new design of frames of reference since the reform of metal-processing training 'is intended to ensure that young people acquire broad-based skills', which is far removed from the 'repeated performance of individual tasks, which is a feature of on-the-job training' (Kuda 1997).

Certainly, the fact that, in Germany, the regulations on in-house training are accompanied by a framework programme of training provided by educational establishments is intended to provide a clearer boundary between theoretical disciplines and the provision of skills.

Scope of standardisation

The stated objectives of French and German vocational qualifications in terms of use, position in the occupational and social hierarchy and possibilities for further studies make it possible to measure their respective closeness to the education system and the labour market.

In Germany, the criteria that have for more than 20 years governed the design and reform of training accord considerable importance to usefulness over time and space: identification of long-term needs, existence of openings in a sufficiently broad field of activity, strict delimitation in relation to existing training, and the impact on continuing vocational training of qualifications that are too specific or whose stability cannot be adequately assessed (Koch, op. cit.).

In France, a considerable amount of work has been done within CPCs over the past 20 years to rationalise the procedures for reviewing qualifications. However, the criteria for defining qualifications and the respective objectives of initial and continuing training are still not precise enough. 'Demands for the creation of qualifications are dealt with individually' (Marquette 1997). The rate of creation is probably accelerated by the ongoing nature of the work of the bodies responsible for it (CPCs). This feature increases the potential for competition between qualifications covering similar levels and areas, thus reducing their market value. Similarly, the frequency of reforms reduces their value as a potential point of reference for both employers and workers when pay is being negotiated. This instability of reference points is offset by the fact that social recognition of French qualifications has more to do with their level than the occupational identity conferred by the area of specialisation covered. The classification of vocational qualifications on a 'one-dimensional' scale (Affichard, 1983) that includes general, technological and vocational qualifications also means that considerable importance is given to general disciplines when candidates are being assessed – which could explain why examination failure rates are significantly higher in France than in Germany (see example of examination tests in the annex).

In Germany, professional and social status, type of employment and prospects of external mobility and promotion depend mainly on the occupation in which one is trained. Choice of occupation is, moreover, all the more important in that German qualifications do not count as a higher level in the general education system. The lack of any strict equivalence between dual and general qualifications (6), despite repeated demands from the social partners (both employers' organisations and the trade unions (7)), helps to maintain the gap between the education system and training followed under the dual system.

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(6) Apart from the fact that a general qualification is equivalent to completion of the first cycle of secondary education for those who have not successfully completed this cycle previously.

(7) The official annual reports of representatives of employers' organisations and the trade unions within the central committee of the BIBB note requests made in this respect to the federal authorities and the *Länder*, with a view to raising the status of vocational training. These requests concern, in particular, the opportunities that should be made available to former apprentices to access higher education without having a certificate of secondary education (cf. *Stellungnahme des Hauptausschusses des BIBB zum Entwurf des Berufsbildungsberichts* 1996).

In the sectors compared, mainly the metal-processing and chemicals industries, and more generally in France in activities in which classification grids are used (Jobert and Tallard 1997), methods of taking account of qualifications in collective agreements are quite similar. They are dependent in both France and Germany on occupation of a post corresponding to the qualification concerned, and it is possible for qualification to be replaced by or associated with work experience. However, in France, the separation between bodies that design qualifications and those that define skill levels leads to a time lapse between the creation and recognition of a qualification. Furthermore, the existence, within a single sector, of several qualifications covering the same specialist area but at different levels (from the CAP to the BTS) means that methods of recognition may vary from one sector to another. Finally, French processes seem to give greater weight to enterprises' in-house regulation procedures (greater recognition of length of service on enterprises' 'internal labour markets') than is the case in Germany, where reference to training remains more important. For example, the abilities required for the skill level corresponding to reference pay (*Ecklohn*) are measured on the basis of training in the dual system, which is 'in accordance with the accepted formula of "usually necessary for the performance of these tasks"' (Drexel 1997).

Changing standards

Changes in work and frames of reference: adjustment from the inside, change from the outside

In both France and Germany, diagnoses concerning the major trends as regards changes in work that have influenced the design of new frames of reference are very similar: economic uncertainty and the variability of demand affect enterprises' production and organisation processes by accelerating the spread of flexible technologies and loosening the boundaries between different functions, such as manufacture and maintenance, in industrial activities. In the administrative sector, there is no shortage of major trends that are common to both countries – with, for example, internationally standardised computer equipment that is increasingly essential for work activities.

In France, a powerful 'technico-economic determinism' (Veneau 1997) is, for some people, erasing the validity of a conception of vocational training that rests on the traditional model of a learned trade; the argument is that this concept needs to be replaced by a function or area of activity, which would mean raising the status of broad technical knowledge above that of specialised occupational knowledge. In Germany, the new training regulations concentrate on describing the functions concerned, without entering into the detail of the techniques used. This 'technically neutral' (Koch 1997) orientation of frames of reference allows enterprises greater flexibility in implementing training, just as it makes it possible to stand forearmed against the risk that training content will become obsolete because it is not reviewed often enough.

In both France and Germany, irrespective of the occupational field in question, the emphasis is being placed on the development of transferable skills that focus more on problem-solving and the ability to find one's place in an increasingly complex organisational system, particularly in order to be able to meet the challenges of task integration and/or multi-functional work (8).

Anticipatory or adaptive approach?

These objectives are reflected differently in the two countries' frames of reference, and this difference has something to do with the respective place accorded to expert opinion in the two processes. In France, determinedly voluntarist public action has the intention of turning training into a direct trigger for changing work and its organisation, which is in contrast with the more gradual, procedural approach that prevails in Germany.

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(8) In France, a particular report strongly influenced the presentation of the UIMM demands that led to the introduction of baccalauréats professionnels (CNRS et Commissariat Général du Plan 1985).

The first thing that emerges here is that the lack of synchronisation between training content and the needs of certain types of enterprises, particularly small and medium-sized ones, has been less marked in Germany (9) than in France. In this respect, it is significant that, in France, the authorities have sought to raise the level of vocational education by creating new qualifications, with the *baccalauréat professionnel* being the current prime example. In Germany, the response to new 'production' requirements has up to now been integrated in the existing system by changing the design of the frames of reference for training by apprenticeship. The reduction in the number of specialised areas is a recognised reflection of this. These changes in basic vocational training, from the inside in the case of Germany and from the outside in the case of France, are a clear reflection of the adjustment methods that prevail in the two countries. German 'organic' adjustment (Silvestre 1986) makes it easier to maintain the coherence of the system and, therefore, the quality of economic and social coordination, even if it means side-stepping in-depth reform. French structural adjustment may, of course, make it possible to achieve major change very quickly, but at the cost of a degree of risk concerning the effectiveness of the new guidelines, given the workings of the labour market and the nature of individual enterprises (Veneau 1997).

These different rhythms indicate a different order of priority in the vital balancing of two conflicting objectives: on the one hand, alleviating the risk of the obsolescence of certain types of training and, on the other, maintaining sufficiently stable points of reference as regards occupational skills.

Specialisation and transversality

Beyond the strictly national debates on the transversal design of vocational qualifications (10), the essential differences between the French and German approaches concern the place accorded to specialisation in the hierarchical structuring of manual skills and in the type of criteria to which the creation of transversal qualifications is linked.

'Dual' certificates are intended to comprise two dimensions: the breadth (*Berufsbreite*) and depth (*Berufstiefe*) of the field of occupational skills and knowledge acquired. Although their respective importance lies at the heart of debates between the social partners, everyone agrees that they must both co-exist if real skill is to be imparted. The argument that developed in Germany in the 1970s between employers' organisations and trade unions in the metal-processing sector as regards the plan to create two levels of vocational training, *Stufenausbildung*, is a prime example (Kuda, op. cit.). The trade union IG Metall, which was initially in favour of such a project, which was likely to promote mobility and take account of the heterogeneity of young target groups, in the end opposed it. Indeed, this internal difference has encouraged selection practices and created a sub-skill corresponding to the acquisition of basic training without specialisation in any particular area.

In France, the very existence of a whole range of qualifications leads to greater dissociation between breadth and specialisation. Depending on level, a qualification is either specialised (CAP), attached to a particular field (BEP, *Bac Pro*) or professionalised (BTS). Thus, specialisation does not occupy the place it does in the hierarchy of occupational knowledge in Germany. Also, the fact that, in France, educational institutions are responsible for virtually all training makes it possible for there to be greater detachment from the type of product or service being produced – that is, from specific economic activities. This distancing seems more difficult to achieve in Germany, not simply because of enterprises' involvement in training but also because the principle of the 'supremacy of the occupation' (Kutscha 1997) still depends largely on good knowledge of the product and mastery of the know-how involved in its manufacture, even according to the most traditional method of working.

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(9) For example, Kuda notes that 'the opposition demonstrated by employers' organisations (in the metal-processing sector) when frames of reference were being negotiated (...) indicated that SMEs were neither wiling nor able to provide in-house training on the basis of the new guidelines' (1997, op. cit.).

(10) The different approaches to transversality reflect the ambiguity of the term and come down to specific issues. It may be taken to mean:
- a very broad range of skills that are common to all training and which encourage autonomy, a holistic approach to problems, adaptability and an ability to communicate. This definition raises the question of how people acquire these skills: via the general education system or through vocational training?
- transversal skills that apply to various industries or sectors of activity but are specific to a particular occupation: this applies in the case of process operators or office jobs. Which institutional framework would be appropriate for certification of these skills?
- integrated tasks (or functional transversality) within a single activity or sector: for example, an operator responsible for running and maintaining plant, or a general bank worker in Germany. In this case, scope for mobility is increased but is still determined by the equipment or product concerned.

In addition to this, the focus of the debate on transversality in France seems to be at a level other than that of the link between training and skills. Analyses indicate that transversal qualifications may, for example, be demanded for strategic reasons (11) – demand from an employers' federation that is seeking to increase its influence (Marquette 1997) – or opposed for reasons pertaining to regulation of the flow of qualified trainees: a demand for a BTS by enterprises wanting workers to receive continuing training may be rejected because it is difficult for the central administration to control the opening of new sections in vocational establishments (Kirsch 1997).

Similarly, the education authorities' recent refusal to merge secretarial and accounting activities in a single BEP, when strongly supported expert opinion points towards such an integration, is evidence of the influence that trends entirely internal to the education system have on the structuring of vocational qualifications. The issue here is to preserve the attractiveness of accountancy training, which, moreover, leads to a broad range of job openings (Liaroutzos 1997). This 'administered' quest for an identity based on training rather than occupation is bound up with the methods whereby training for office jobs takes its place in the French education system. This is mainly attributable to the fact that vocational training for tertiary jobs is in competition with general training, be it upstream (training of this kind, and particularly accountancy, tends to be taken by students who are the highest achievers in general disciplines) or downstream, when students are entering the world of work.

In the case of Germany, the restructuring of this type of training, which is tending to integrate fields that were previously separate, is much more closely linked to the impact of information technology, in that the reference to 'occupation' is not as constant as in industry. Whatever the case, vocational training for tertiary jobs remains independent of general training and is no more subject to competition than training for jobs in the industrial sector.

Current tensions

In both France and Germany, there are powerful tensions that reveal the specific difficulties the two institutional processes are facing in adjusting to current changes, whilst still preserving the meaning of their respective structures.

In France, these difficulties seem to be associated more with the relatively abstract and inflexible nature of frames of reference in relation to enterprises' actual situation and diversity. Little involved in the provision of training leading to qualifications, French enterprises want to leave it to the experts to design 'essentially basic training', so that they can then supplement this by providing specific knowledge and know-how (CNPF, quoted by Marquette, op. cit.). This is a kind of 'consensus à la française' – at least between the authorities and the more centralised level of employer representation – concerning the purpose of vocational qualifications. This option does, however, involve the risk that French qualifications sacrifice some of their immediate applicability and may, therefore, be seen as providing only a small proportion of skills. It also tends to 'increase the swing towards loss of identity for vocational training' (Veneau 1997). It is distinct from the bottom-up construction of qualifications, as exemplified by the *certificats de qualification professionelle* (CQP – certificates of occupational skills) in the metal-processing sector. Does this mean, then, that what we are seeing is the emergence of an alternative model to the general qualifications offered by the national education system?

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(11) Earlier analyses of the situation in Germany support the view that such strategies exist there (cf. Hilbert, Südmersen and Weber 1990).

Recently introduced, CQPs are not the only indication of a move to counter the unitary tendency of frames of reference for qualifications. The diversity and burgeoning of initiatives to create new forms of certification – at national, regional, sectoral and training-body level – indicate that the debate is not yet over, even though they do not help to clarify it.

In Germany, the 'functional pragmatism' (Kutscha 1997) of the adjustments that have taken place so far is thrown into question by the more rapid rate of change that could require structural reform. Will the lengthiness of the process of mobilising and involving the actors concerned remain compatible with the increasing fluctuations of the labour market and the constant shifting of enterprises' needs towards greater transversality?

The complementarity of the German system derives from a long development over time, which has made it possible, in both industry and small trades, to find a compromise among the many regulatory approaches. Now, given the lesser involvement of the social partners in the tertiary sector, the German system is finding some difficulty in dealing with new activities in this field, which is nonetheless accounting for a high proportion of new jobs and will continue to do so in the future.

Finally, is it possible for frames of reference to continue to be so powerfully polarised as regards the appropriateness of occupational skills and competitiveness? This is currently a very pregnant question, as is evidenced by the fact that, at the most crucial moments, the Ministry of the Economy is a major State agent in the structuring of vocational qualifications. Social demand, which is taken into account relatively little in the German system, is becoming an increasingly decisive factor in the development of dual training, because of young people's growing attraction to pursuing general studies. How can institutional regulation integrate this trend, if it should persist and grow, without somehow introducing the notion of training levels? The issues currently under debate concern both the need to attract young people with a high standard of education into the dual system and ways of integrating young people with educational problems, who are going to represent a growing proportion of the potential target group (Koch 1997).

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III. Competence and qualifications' development in the light of continuing education/training and lifelong learning

Chapter III deals with comparative research, as Chapter II, but under the heading **further education and training and lifelong teaching and learning**. Many of the arguments set out in Chapter II can be carried over and applied to the further education of adults and early school-leavers but, in addition, there is a whole new range of challenges in view of the changing needs for competencies and skills among individuals, companies and the economy as a whole. The two articles together cover the most important categories. While the first article discusses general education and training needs, the new forms of education and training on offer and the educational structures that need to be developed, the second article looks at the education and training needs themselves and how they are the result of new corporate developments and trends in work organisation. The flexibility and adaptability of workers, and their active integration in the new organisation of work and production is emphasised, as a result of which the workforce faced certain challenges as regards education and training, whether employed or unemployed.

Graham Attwell and Alan Brown have examined the **competence and skills needed for lifelong learning** and the trends and challenges across Europe. Qualifications for lifelong learning had become a 'conditio sine qua non' and were regarded as core skills of individuals in order to enable them to have a better chance to develop and maintain their career. This had led to an increasing focus on vocational education and training, particularly at the interface between school and work. Permanent employment as an experienced skilled worker in one occupation would in future be more the exception than the rule. Occupational mobility and flexibility would rather become more necessary for individuals and organisations in the face of increasing competition and productivity.

It was not merely a question, however, of workers being able to adapt to new tasks and fields of activity, but rather of them being able to handle the rate of change, organise their lives accordingly and play an active role in the change processes. The need for continuing and lifelong learning was not just the concern of a handful of university and college graduates and professionals. Rather, every man and woman had to be prepared to undertake continuing learning and to be open to new conditions, be they economic, cultural, social or political. This challenged the very taxonomies of knowledge and meaning, skills and experience of European society, dating from the time of the Renaissance, which now had to seek a new identity. What were the new paradigms of learning, the 'what' of learning and also the 'how' and 'why' as the late industrial society drew to a close and a 'cognitive' or 'knowledge-based society' dawned?

Hartmut Seifert presents an overview of the various areas of continuing vocational training, basing his article on **the links between further training within companies, outside companies and industry-wide** in the light of the fact that it was becoming increasingly important for every man and woman to undertake continuing training and lifelong learning their whole lives long. Was the training provided by institutions and under the statutory and collectively agreed regulations enough, and did the resulting structure of training supply suffice? He gives examples of the situation in Germany, and comes to rather negative conclusions, stressing the need for adaptability, both in current work organisation and labour market policy and in continuing vocational training and adult education. A closer relationship between work and learning was crucial, whether in companies, further training centres or technical colleges and universities, and could be provided on the basis of new work organisation models and collectively agreed regulations. These regulations would have to place greater emphasis on the above needs.

The existing options had not allowed for the interests of companies, individual workers and persons participating in continuous training to be taken into equal account. Neither the unemployed nor the employed, particularly the low-skilled, were being given further training at the right time and they could therefore not apply for the jobs most suitable to them. Any reform of the continuing education and training systems had to provide for a mutually agreed distribution of tasks between companies and public authorities and be based upon the general continuing vocational training needs of the employed, job seekers and the unemployed. In addition to the need for collectively agreed regulations, there was also a pressing need for relevant continuous education and training legislation.

A. The acquisition of skills and qualifications for lifelong learning, trends and challenges across Europe

Graham Attwell (¹) *and Alan Brown* (²)

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Introduction

In the light of the economic upheavals and social change of the last 25 years and ongoing profound technological and structural changes in labour markets and work processes, qualifications for lifelong learning have become a 'conditio sine qua non' and are regarded as core skills of individuals in order to enable them to have a better chance to develop and maintain their career (European Commission 1993, 1995). This has led to an increasing focus on vocational education and training in the European Union's Member States. Vocational education and training is central because the structures, agencies and processes at the interface between school and work are crucial for the development of qualifications for, and a positive attitude towards, lifelong learning.

Changing contexts and arrangements of learning between education, training and employment can be a powerful means to develop key skills, the ability to transfer skills, knowledge and understanding, and a sense of significant skill ownership. One of the central concerns of vocational education and training in Europe in the 1990s has been how to support those undertaking VET programmes, such that not only can they perform more effectively in their existing jobs, but also so that they are better equipped to handle changes in the future. Increasing attention has been paid towards developing orientations towards flexibility, change, and the future, rather than simply training for existing jobs. This has led to the development of the concept of lifelong learning and placed increasing focus on the relationship between school to work transition and continuing training as underpinning the development of skilled work for flexibility, innovation and the creation of enterprises and jobs.

Because of the uncertainties of the future European labour market, even a successful transition from school to work, however, will often not result in permanent employment as an experienced skilled worker in one occupation. Rather, occupational mobility and flexibility will become of increasing importance to individuals as well as for organisations. Therefore a positive attitude towards lifelong learning will become more and more part of occupational identity and structures. Methods and approaches used in educational systems have to be developed further in order to foster the interaction between learning for, and at, work and within and across different sectors and forms of education in an integrated and iterative way.

Existing European programmes and projects are looking at the different routes open to young people after the age of 16 and are developing and piloting qualifications with a dual orientation towards employment and continuing education and training in the different partner countries (Brown and Manning, 1998). However, there is a need to go further and examine the dynamic processes at play and to develop models of good practice for enhancing the efficiency of the acquisition of qualifications for lifelong learning in order to inform policy development at national and international levels. This paper is based on the Socrates study and analysis project 'Effective processes for the acquisition of qualifications for lifelong learning' (Lifequal), which has been designed with just such an intention.

This contribution is looking at the changing social and economic context in which requirements for lifelong learning are proposed, and goes on to look at the requirements and challenges of these changes, in terms of the content, pedagogy, situation and context of learning. Challenge includes the 'what' of learning and also the 'how' and the 'why'. The changing nature of late industrial society challenges the very taxonomies of knowledge and meaning of European society, dating from the time of the Renaissance. The third part of the paper looks at responses to these challenges in the Member States of the European Union, drawing attention to different ideas and trends. What are the new paradigms of learning and what are the implications for initial and continuing vocational education and training of greater emphasis upon individuals being able to transfer what they have learned between contexts and to participate in processes of knowledge creation in organisations? Finally we attempt to draw some conclusions in terms of recommendations for policy makers and planners. The challenge for vocational education and training is to transcend the requirement to respond to rapidly changing economies, to help to shape the forms of technology and work in the 21st century.

I. Economic and social challenges

1. Technological change and increasing internationalisation of economies

There have been dramatic changes in the economies of the world in the last quarter of the 20th century which have led to new requirements and challenges for vocational education and training. The first major driving force behind economic change has been the rapid implementation of new technologies. This can be seen most strikingly in the emergence of whole new industries engaged in the production and distribution of information. However, this change is not limited to the computer and information technology industries, even more profound is the penetration of the new technologies into almost every area of business and manufacturing activity. The second key force behind the economic transformation is the growing internationalisation of economies. Many factors have contributed to this, ranging from relatively peaceful international relations since the end of the Second World War, to massive technological change in communications and transportation (Cisneros and Weiss, forthcoming) and the development of economic free trade zones. The exposure of many manufacturing industries all over the world to international competition, and the growing globalisation of capital, has resulted in a dramatic increase in the productivity of labour and has led to significant industrial restructuring. This has in turn taken a number of different forms.

2. Changes in the spatial location of industry

There has been a decline in older extractive and heavy industrial centres and a general trend to relocation in suburban areas and areas with good infrastructure links within individual regions and countries. At the same time there have been movements towards clustering of industries in particular locations. Internationally the transfer and development of new technologies in the 'developing' countries has led to both competition with the old industrialised nations, new world centres of production and a trend towards the movement of low value added mass-production to lower wage economies.

3. Changes in sectors and industries

The past period has seen dramatic changes in the importance of different sectors and industries in every industrialised country particularly in relation to employment. The agricultural sector has continued its steady decline and there has been a marked decrease in employment in the extractive industries. Most remarkable has been the decline in employment in manufacturing and a corresponding increase in services. At the same time there has been rapid growth in technology-based industries such as consumer electronics, computers and microchips. Recently there has been a rapid growth in information-based services.

4. Changes in products

Changing consumer demand has led to a decline in mass produced products with a rise in demand for customised products with shorter production runs. This is turn has led to increasing importance for design processes within production. Added to the impact of the introduction of new technologies this has resulted in a drastic reduction in the product life cycle.

5. Increasing focus upon quality

Consumer demand and heightened international competition have led to the introduction of new forms of quality control. The implementation of new quality systems such as total quality management (TQM), and ISO 9000 have resulted in significant changes in the processes of production. These changes have fundamental implications for the nature of work in the late 20th century. In 1974 Braverman published his seminal thesis predicting that increasing automation would lead to a general deskilling of work. As a general trend, however, this has not happened. Rather there has been a bifurcation in labour markets, with evidence of both deskilling and up-skilling. While there has been an increase in automation and a strengthening of Taylorism in some production and service processes, in other settings the skills required of workers have been considerably increased. The latter process, influenced by the new management paradigm of the learning organisation, has led industrial sociologists to proclaim the advent of a post-Fordist society. This is likely to prove an overstatement too, although in a diametrically opposite direction to Braverman (Wright and Edwards, 1998).

Whilst it is possible to identify divergent trends between the leading world industrial centres of Japan, the USA and Europe, profitability and competitiveness are increasingly seen as dependent on the skills and knowledge of the workforce (Bewick, 1997). It is this new paradigm or new degree of consciousness, linked to the rapid implementation of new technologies and new products, which has led to the focus on lifelong learning.

6. Innovation, competitiveness and social cohesion

In Europe researchers and policy makers alike increasingly stress the importance of skills and knowledge for accelerating innovation. Product and process innovation are seen as central to the competitiveness of the European economies and to the creation of employment. This is particularly so in the context of the European cultural tradition of social partnership and social inclusion. Such a tradition emphasises not only economic competitiveness but also social cohesion. Regional learning environments comprising learning organisations in enterprises and public bodies are seen as central to both the generation of new enterprises and competitiveness and to the promotion of social inclusion and personal self-fulfilment. The combination of technical and work organisation innovation, the economic development of regions with concomitant reduction of unemployment and social reform, is known in current debates as the 'social organisation of innovation'. Innovation has traditionally been seen as technologically determined. More latterly, researchers have pointed to the limitations of such a linear and deterministic analysis of the development of innovation and have pointed to the choices in the way technology is developed and implemented (Nieuwenhuis, forthcoming; MacKenzie, 1996). Thus innovation has a social nature and workers have a key role in the shaping of technology and the organisation of work (Heidegger, 1997).

Politicians and social scientists are seeking a specifically European path for development, which can take up the opportunities of accelerating modernisation while confronting the risks inherent in these opportunities. Two recent European Commission White Papers, 'Growth, competitiveness and employment' (1993) and 'Teaching and learning: Towards a knowledge-based society' (1995), emphasise the centrality of vocational education and training in furthering economic and social competitiveness. In meeting the challenge of the information society human resources are seen as important as technological development.

7. Continuing development of skills and knowledge

Skills and knowledge are also viewed as integral to the promotion and maintenance of individual employability. Thus, European policy stresses the importance of individuals taking responsibility not only for the acquisition of initial education and training but also for maintaining that knowledge through their working life. Finally, skills and knowledge are seen as central to the development of social citizenship through informed participation in democratic decision-making. The introduction of new technologies and the increase in scientific knowledge demand continuous learning as a basis for social participation.

8. Stronger emphasis upon flexibility, adaptability and mobility

Whilst vocational education and training has found new favour with politicians, policy-makers and planners alike, traditional curricula and learning processes are seen as insufficient to meet the need to develop the skills and knowledge required by the new economies. Traditional definitions and explanations of professional competence or expertise have been based on theories of technical rationality – on the basis that learning can be applied in predictable and repeated ways (Edwards, 1993). Vocational education and training curricula and processes have traditionally been based on imparting a fixed body of knowledge and skills required for identified tasks within occupational roles. With the rapid rate of change in today's industrial society these roles and tasks are no longer fixed and predictable. Vocational education and training is now increasingly putting an emphasis upon the flexibility and adaptability of individuals (Nijhof, 1998; Oates, 1998). Workers need to be able to adapt to new skills and processes and to update their knowledge on a regular basis. Skilled work increasingly requires the ability to deal with unpredictable occurrences. Occupational profiles are no longer fixed but mutate and migrate over time (Heidegger and Rauner, 1997). There is a tendency towards far broader occupational profiles than the narrow boundaries of skills and knowledge application based on Taylorist work organisation. New forms of working organisation place a priority on communication skills and on the ability to work in teams.

There are other significant changes in skill requirements. In the past the vast majority of people have lived within five kilometres of their birthplace (Parkes, 1998). Today's society demands increasing mobility, both within countries and, in the European context, between Member States and beyond. There is a growing necessity for competence in foreign languages. It is not only the content of skills and knowledge that is changing. The new information and communication technology industries in particular are demanding higher levels of skills and qualification.

9. Necessity of learning to learn

The pace of change in many aspects of work and the work environment put a premium upon the ability to learn. Learning to learn is seen as fundamental if workers are to be able to adjust to changes in organisational structures, technological innovation and almost constant change to work processes. One key attribute, associated with initial skill development, which needs to be developed, is the ability to pick up the threads in future when skills need updating. That is, young people need to be confident about their ability to learn in future. Learning to learn can thus be seen in terms of the ability to consciously shape and determine one's own vocational and occupational biography. Learning to learn, or self-directed learning, may also be considered as having a social and cultural, as well as an individual, nature. Straka (1997, p. 4) proposes that self-directed learning is 'the key qualification for mastering global competition and constructing a humane society at a European level'.

10. Social shaping as a goal

There is a growing critique of the European vocational education and training agenda as being 'economistic' in viewing qualifications as necessary for adaptation to technological and economic demand. Heidegger (1997) argues it is not enough for skilled workers to be able to respond to the changing requirements of our society. Instead they need the skills and knowledge to be able themselves to shape the application of technology and the social form of work. Heidegger believes there is a dialectical relationship between education, technology and work. Rauner (1998) also points to the inadequacy of existing taxonomies of knowledge, seeing the need to overcome the duality between academic knowledge (brain work) and vocational skill (hand work) which he traces back to the Renaissance. In the 21st century he suggests, work-related knowledge will become central to both profitability and social community.

II. The importance of work-related knowledge

The cognitive side of occupational competence is key to the development of context-related expertise: with work-related knowledge providing the link between knowledge, which is not context related, and experience at work, which may not necessarily be used in a generalised way. This implies both the need for active reflection upon experience and a shift from information to knowledge: expertise cannot be developed through simple although extended acquisition of information, but only through continuous and subtle cognitive experiences related to putting knowledge into action, co-developing personal and professional knowledge, and integrating individual knowledge into the larger dimensions of knowledge held by groups and whole organisations.

1. Need to focus upon learning and knowledge development

In terms of VET innovation, a shift of emphasis is required from training to learning and from the mere transmission of knowledge through training intervention to the facilitation of learning, i.e. the creation, use and circulation of knowledge, through more complex interventions in which training is mixed with other kinds of human resources development (HRD) practices. In particular, it seems as if VET has to ensure that individuals are able to contribute to the processes of knowledge development, transmission and diffusion within organisations.

2. Knowledge development as a key factor in innovation

The focus upon particular kinds of knowledge development has been identified as a key factor in innovations designed to increase the supply of creative knowledge value: 'what is important for the production of knowledge value is not so much facilities or equipment in the material sense, but the knowledge, experience, and sensitivity to be found among those engaged in its creation' (Sakaiya, 1991, p. 270). Knowledge is thus assumed as the real driving force of our era, but also strictly linked with day-today problem-solving and problem-setting in working situations, and more generally with the professional competencies and expertise.

3. Different types of knowledge

When thinking about knowledge development in a richer way, it may be useful to distinguish different types of knowledge. Lundvall and Johnson (1994) identify four kinds, each requiring different types of mastery: know-what, know-why, know-how, and know-who.

Know-what refers to the knowledge about 'facts': it can be considered as equivalent to what is normally called information and related to the knowledge 'corpus' that each category of experts must possess.

Know-why refers to scientific or professional/vocational knowledge, influencing technological development and the pace and characteristics of its application in industries of every kind. In this case, knowledge production and reproduction take place within organised processes, such as university teaching, scientific research, specialised staff development, recruitment and so on.

Know-how refers to the capability to operate skilfully in different contexts (e.g. judging the market prospects for a new product, operating a machine tool, etc.). Know-how is typically developed at the individual level, but its importance is evident also if one considers degrees of cooperation taking place within organisations and even at the inter-organisational level (for instance, the formation of industrial networks is largely due to the need for firms to be able to share and combine elements of know-how).

Know-who is another kind of knowledge which is becoming increasingly important, referring to a mix of different kinds of skills, in particular the social skills, allowing the access and use of knowledge possessed by someone else, often through a combination of professional and personal networks (Erault et al., 1998).

Vickstroem and Normann (1994) argue a similar line in their attempt to develop a new perspective of corporate transformation. They distinguish: information, skill (or know-how), explanation, and understanding. Information is knowledge of an objective kind whose importance is mainly related to its 'factual' nature but is not limited to that. For instance, the addition of new information about a certain topic can modify the pattern in which this topic was conceived letting a new intellectual structure

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emerge. Skill or know-how, unlike information, is embedded in individuals, as they are able to behave purposefully in a particular situation in order to achieve a certain result. Explanation refers to scientific/professional knowledge, it is not person-based and can be found in articles, textbooks, and so on. Explanatory knowledge very often provides the basis for problem-solving activities. Understanding is the most profound form of knowledge, arising when principles and connections are recognised. Understanding is thus embedded in individuals and is central to the creation of new knowledge.

Each kind of knowledge is characterised by different channels through which learning takes place. The easiest cases are those of know-what and know-why, that can be obtained through the typical channels of knowledge acquisition (reading books, attending lectures, accessing databases), while the other two categories are rooted primarily in practical experience and are more problematic insofar as they require the availability of informal social channels. They are also the types of knowledge upon which dynamic organisations depend and companies are particularly interested in whether new recruits will be able to contribute to the creation and development of such forms of knowledge.

Apprenticeship, alternance training and other forms of VET which involve on the job learning are fundamental channels for acquiring know-how knowledge: they represent the most important way for skilling newcomers in an organisation, these protracted processes of learning by doing are also frequently the responsibility of those who are considered the experts in an organisation, capable of above-average performance. Simulations are sometimes used as shortcuts for reproducing the many aspects of the know-how acquisition available in real situations. Know-who, too, – as Lundvall and Johnson (1994) point out – is socially embedded knowledge which cannot easily be transferred through formal channels of information. It is learned in social practices and through participation in particular networks (like those taking place in the professional communities giving the participants access to information bartering with professional colleagues).

4. Tacit knowledge and its application

Work-related knowledge is to some extent quite difficult to pin down for two reasons. First, it contains a tacit dimension and, second, it is bound up with particular social contexts: that is, work-related knowledge is applied within particular communities of practice, whose members develop ideas about how knowledge should be acquired, applied and shared.

The term 'tacit dimension of knowledge' was originally proposed by Michael Polanyi (1962). The basic idea is that 'we can know more than we can tell.' There is a level of knowledge that cannot always be put into words and linearly explained. In this dimension, in which the concepts of know-how, skill, competence, and expertise are rooted, knowledge is a practical and theoretical ensemble, whose development and mastery take place through procedures which cannot be identified in linear terms. In fact, the results of cognitive processes are often obtained only by successive approximations. The acquisition of specific elements of knowledge that we possess, but may be unable to express, comes about, in many cases, by focusing our attention on further elements and by successive feed-back on what we have previously learned. The discovery (or acquisition) is facilitated by anticipating the implications that are yet to be determined. In this way, knowledge accumulated in a cognitive system, although not expressed, makes up an implicit framework orientating the ways in which other elements enter the system successively. This is the reason why individual skills are usually tacit: 'the aim of a skilful performance is achieved by the observation of a set of rules which are not known as such by the person following them' (Polanyi 1962, p. 49).

The social nature of work-related knowledge has been underlined by drawing attention to the social context in which knowledge is acquired, developed and applied. The most relevant part of knowledge is seen as interpretation of experience, based on idiosyncratic frameworks that at the same time favour and limit the individual process of sense-making (Resnick, 1991). Situated cognition, the situation in which cognitive acts take place, is the driving idea of this approach, recognising that individuals are very sensitive to their cultural context. The latter provides a complex fabric of references (exchange of information, cooperation, etc.) that in the long run give shape to individual knowledge and determine a social construction of knowledge. Understood this way, the context creates a dynamic equilibrium between the know-what of theory, and the know-how of practice. It is through the tight interdependence, or co-production of theoretical and practical knowledge (Brown et al., 1989), that competencies can be developed and maintained.

The social nature of work-related knowledge is also stressed in the cultural-anthropological perspective. For instance, Orr (1993) analysing the working behaviour of work groups for repairing photocopiers, shows that technicians develop their knowledge over time through problem-solving and continuous interaction. The defects of the machines they have to cope with are often very different from the ones reported in the standard operational manuals, therefore problem-solving and problem-setting happen collectively on the basis of previous experiences of each member of the group and on the basis of various types of communication, even the informal chatting around the coffee-machine. This way, knowledge is continuously created and maintained within a specific community of practice, having its own language and myths (partly through the handing-down of war stories, reporting the main events of machine repairing and client dealing).

Recently ideas about the application of tacit knowledge in particular social contexts have been developed further in considering moves to create 'knowledge-creating companies' (Nonaka and Takeuchi, 1995). The model is based on the assumption that knowledge in organisations, especially in the most innovative enterprises, is created through the interaction between tacit and explicit knowledge, continuously 'converting' one into the other one. The model postulated four different modes of knowledge conversion called socialisation (from tacit knowledge to tacit knowledge), externalisation (from tacit knowledge to explicit knowledge), combination (from explicit knowledge to explicit knowledge), and internalisation (from explicit knowledge to tacit knowledge).

Socialisation is a process of sharing experiences and thereby creating tacit knowledge, such as shared mental models about the application of skills. This occurs in the particular case of on-the-job-learning during apprenticeship, in which tacit knowledge directly derives from the master/trainer – not through language but through observation, imitation, and practice – and is then converted into the tacit knowledge of the apprentice. It is a process which cannot be abstracted from associated emotions and from the specific contexts in which shared experiences are embedded. Externalisation is a process of articulating tacit knowledge into explicit concepts. It is generally based on metaphors, analogies, hypotheses, images or models from which new ideas and products can be generated through interaction between individuals who want to reach the same outcome.

Combination is a process of systematising concepts into a knowledge system, through combining different bodies of explicit knowledge. The media for this purpose can be very different (documents, meetings, telephone conversations, computerised databases, and so on). Reconfiguration of existing information through sorting, adding, combining, and categorising explicit knowledge can lead to new knowledge. Internalisation is the process of embodying explicit knowledge into tacit knowledge. It is closely related to learning by doing: the sum of experiences gained by individuals through socialisation, externalisation, and combination can become individuals' tacit knowledge base in the form of shared mental models or technical know-how. But internalisation can also be reached through other forms: for instance reading or listening to success stories can induce new levels of tacit knowledge in the members of the same organisation and the establishment of new shared mental models within the organisational culture.

The four modes of knowledge conversion are structurally interconnected. Different events of organisational life can be viewed from a perspective of incorporating each of these modes in the processes of knowledge creation. Of course an organisation cannot create knowledge by itself but can only mobilise tacit knowledge created and accumulated at the individual level. Tacit knowledge of individuals is the basis of organisational knowledge creation 'organisationally' amplified through the four modes of knowledge conversion. Nonaka and Takeuchi (1995) define this process as the 'knowledge spiral' in which the interaction between tacit and explicit knowledge will become larger in scale as the relationships among the four modes are continuously increased and managed.

In this perspective, organisational knowledge creation, which could be considered a subtler way of viewing organisational learning, is a spiral process, starting at the individual level and moving up through expanding 'communities of interaction', that crosses sectional, departmental, divisional, and organisational boundaries within and beyond the organisation. Overall, work-related knowledge appears as a very complex and multifaceted issue, involving several different and sometimes contradictory dimensions, which can be synthesised in the kinds of relationship between explicit and tacit knowledge. Organisations, with business processes highly dependent upon the continuing development of work-related knowledge, are therefore particularly interested in whether new recruits will be able to make substantive contributions to the creation, transmission and diffusion of work-related knowledge. This perspective has clear implications for the relationships and interactions between initial education, school and work, continuing vocational training and lifelong learning.

III. Responses to the challenges

In the first part of this paper we examined the new social and economic challenges currently facing vocational education and training planners and policy makers. In particular we focused on how the changing nature of industrial economies is placing new demands on knowledge creation and innovation and we examined how such knowledge may be created. We have highlighted the relationship between skills and knowledge, and their interplay in lifelong learning, knowledge development and innovation. In this section we examine the processes which underpin the acquisition of the skills for lifelong learning. In so doing we will attempt to highlight examples of good practice.

1. Two prerequisites for lifelong learning

One of the major challenges for VET which flows from our analysis of the social and economic challenges and of new knowledge requirements is how to support those undertaking VET programmes in such a way that they can not only perform more effectively in their existing jobs, but also so that they are better equipped to handle changes in what they will be required to do in future. The trend has been to develop flexibility in trainees and workers such that they are able to cope more effectively with change and be better prepared for what they may be required to do in the future, rather than simply training for existing jobs. These concerns relate both to initial education and training and continuing vocational education and training.

In a discussion of the interactions between changing patterns of initial vocational education and training designed to facilitate lifelong learning and changing business processes, it seems as though there are two essential developmental tasks young entrants have to be able to do if they are to function effectively in dynamic companies which are operating in the new knowledge-intensive environments. First, they need to be able to transfer what they have learned in other contexts to their new working environment. Second, they need to engage in knowledge development in, and on behalf of, their companies. Both these processes warrant further investigation as neither process is unproblematic. The issues of transferability and knowledge development and the implications of supporting the development of these both within work and initial and continuing vocational education and training are central questions for the future development of vocational education and training in Europe.

2. Promotion of transferability

As many jobs are becoming more complex, this puts a premium upon the ability to transfer knowledge and skills to different situations.

Research highlights the importance of learners developing mental maps (Soden 1993), so as to be able to organise what they have learned, with the increased possibility that they could then apply this elsewhere. Transfer, however, tends to be highly specific and it needs to be guided: it rarely occurs spontaneously. Perkins and Salomon (1989) argue transfer is possible, depending upon how knowledge and skills have been learned and how the individual deals with that knowledge in different contexts, and that two conditions are generally required for transfer to take place: context-specific knowledge and general skills have to be brought together and the approach to learning needs actively to seek ways to encourage transfer.

If one intention of a learning programme is to help learners develop the ability to transfer skills, knowledge and understanding, then learning contexts are required which draw attention to the significance of skill transfer. For example, this could involve actively helping people to look for opportunities to transfer skills, knowledge and experience and giving them opportunities to practise making successful transfers (Blagg et al., 1992). Exposure to a range of contexts then can be valuable both for the way it can enhance and lead to a more complete ownership of a skill (Hayes et al., 1983) and because it allows learners to make connections (and think about transfer) between contexts (FEU, 1984). Pea (1987) argues that it is necessary to promote a transfer culture, and this would include organising an affective climate directed at transfer. Hence attempts should be made to make transfer strongly linked to learner motivation and commitment. The whole thrust of this approach then is that learners in particular, but also trainers and tutors, are encouraged to analyse contexts for the increasing the possibilities of skill transfer.

Hayes (1992) and Achtenhagen (1994) highlight the potential for simulations or extended project work to integrate a number of strands of learning and to seek to promote the ability to transfer from that base. The requirement that learners integrate a broad range of experiences, besides having the capacity to develop the ability to transfer, can itself also help in the development of learners' critical thinking and conceptual skills (Winter et al., 1981). This does, however, depend upon learners being given opportunities for reflection so as to broaden the generality of skills and knowledge learned (Hammond and Collins, 1991). Similarly in a recent case study in Finland Anti Kauppi has pointed to the value of broad-based learning tasks which 'guide the students towards acquiring the essential concepts and knowledge structures as well as to examine the models of thinking and acting in the work life' (Kauppi, 1998, p. 81).

In a recent document on the need to promote transferability in learning programmes Oates (1998) emphasises the value of the development in learners of adaptability for 'the transformation of existing skills and knowledge in order to perform effectively in unfamiliar tasks' (Oates, 1998, p. 1). Note that what Oates terms adaptability could be broadly regarded as what is termed transferability in the context of broader European debates about these issues (Nijhof and Streumer, 1994). Oates also highlights how problem-solving approaches in mathematics have yielded enhanced performance in the application of skills through stimulation of enquiry in unfamiliar settings (Boaler, 1996). Medical training is also quoted as an area which has been effective in securing skill transfer. Although Oates refers to evidence of skill transfer in medical training from the USA and New Zealand (Newble and Clarke, 1986), problem-solving approaches are now almost universal in the early stages of medical training in the UK and these have had marked effects on motivation and resulted in significant reductions in drop-out compared with the more traditional academic approaches previously used. These approaches also utilise a careful sequencing of theory and practice, a focus upon learning styles and deliberate use of a wide range of learning styles (Newble and Clarke, 1986).

Oates goes on to argue that although 'the precise details of the models vary.....they share a common theory-driven pedagogy, focusing on principles of fostering autonomous re-deployment of skills, through learning programmes where difference in context is managed carefully as a key aspect of the learning programme.....the crucial component therefore seems to be the following: pedagogy and programme management driven by a coherent model of skill transfer, not the simple implementation of a list of key skills' (Oates, 1998, p. 24).

3. Learning to learn

There is almost universal recognition of the value of learners learning how to learn (Novak and Gowin, 1984), and this can give a basis for continuing learning in the workplace. As a consequence getting learners to learn how to learn is often given as an aim in programmes of initial vocational education and training. However, this does not ensure the issue will be addressed in practice (Evans et al., 1987). This is because of the historic problem associated with many education and training programmes which rather focus upon those tasks that are easier to teach and/or assess (Sockett, 1980). Conversely, the development of more general skills, including learning to learn, which underpin much activity in education, training and employment, can be seen as the responsibility of everyone, and hence in practice of no-one in particular.

'Learning to learn' can be linked to the inculcation of habits such as systematic observation, analysis and a questioning attitude (Annett and Sparrow, 1985). This is important especially if learners are to take advantage of opportunities for learning outside formal education and training settings. This links to the need not only to embed the development of learning strategies within an occupational context (Soden, 1993), but also indicates that the application of learning strategies should be contextualised. People need to learn how to apply effective learning strategies in a variety of contexts, particularly if they are likely at some stage to be in contexts where there are considerable demands to learn while working.

4. Reflection

There is a need to create and sustain a culture within organisations which values learning and development, and reflection can be an important process to help achieve this (Brown and Evans, 1994). Any individuals with an ability to transfer what they have learned between contexts will need to be reflective both of their own practice and their own learning. Attempts should be made within VET to ensure learners will be able to reflect upon their working practices: ideally so they can set up spirals where what is learned from reflection on practice can inform action, thereby leading to further learning (Winter, 1991). While the need for any learning programme to seek to develop a reflectiveness among learners should be readily apparent, an emphasis on reflection can also act to draw attention away from concerns with the acquisition of a fixed body of knowledge or a set of immutable competencies: practice itself should always be seen as developing.

Hence it will be necessary for individuals to be able to continue to build and refine their own base of knowledge and understanding through reflection on practice, building a spiral of action and appreciation, leading to reflection-in-action (Schön, 1983). Critical reflection on experience then is seen as a motor for learning at work (Kolb, 1984; Schön, 1987). The staged model of skill acquisition of Dreyfus and Dreyfus (1980) identifies the key to successful progression through to the expert stage as the processes of review and critical reflection. Critical reflection then is widely recognised as pivotal (Hammond and Collins, 1991; Tomlinson and Kilner, 1991) to the development of expertise.

5. Development of thinking skills

Just as policy-makers have been acknowledging the importance of developing in learners learning to learn skills, so increasing interest has been expressed about the further development of thinking and problem solving skills. Blagg et al. (1993) conclude from a fairly comprehensive review of the evidence that enhancing thinking skills can have positive transfer effects. One highly influential text (Collins et al., 1989) put forward the notion of a cognitive apprenticeship, where explicit attention is given to the development of cognitive skills. It emphasises modelling approaches to thinking while tackling problems within a domain, through demonstrations, coupled with coaching, offering hints and regular feedback within situations where learners tackle problems themselves.

Collins et al. (1989) also highlight the importance of learners making their thinking processes explicit, including through the use of articulation, whereby learners articulate the knowledge, reasoning or problem solving processes they are using. The sharing of ideas about thinking processes can be a valuable means of learning for both learner and coach (Brown et al., 1994). However, such sharing can also be valuable in group settings, where learners can access (develop, organise and become aware of) their own and others' knowledge and approaches to problems (Prawat, 1989).

Soden (1993) argues that there is particular value in teaching and making explicit the thinking that occurs in solving problems in occupational contexts, as 'good problem solvers have internal representations of fundamental principles relevant to their occupational area and these representations are connected to each other and to broader relevant knowledge in ways which facilitate application to problems' (Soden, 1993, p. 12).

Rissland (1985) believes it is therefore essential for tutors to create a framework that can help learners organise their learning in the domain in which they are working. Learners need to develop schemas to organise what they are learning, particularly if training is exploration-based, not least in order to enable the transfer of what they have learned (Hesketh et al., 1989). One important aim then for developing expertise should be to get learners to build integrated knowledge representations (Landa, 1984). Teaching should then 'have a dual focus – the development of the thinking skills as well as the achievement of the targeted competence' (Soden, 1993, p. 3).

Soden (1993) also signals the usefulness of getting students to engage in concept mapping. This is compatible with earlier research (Schmeck, 1988) showing that those with a deep learning style were likely to organise ideas into networks, which linked different concepts. Soden (1993) was involved in a project to get tutors to teach thinking skills to groups of learners taking vocational modules in Scottish programmes of initial vocational education and training. The work demonstrated the potential of the approach and that learners' problem solving performance could be enhanced.

Learners, therefore, need not just to learn efficient mental processes, but also need to learn when and how to use them in practice. There is, therefore, an emerging consensus on the value of teaching thinking skills to facilitate the problem solving performance in particular contexts. This teaching, however, should be embedded in and directly linked to solving problems that occur in a particular occupational/situational context. Learners should also be encouraged to articulate their thinking processes and be given opportunities to practise using and reflecting upon the relational networks they are developing.

6. Development of learner independence

What the above examples reinforce is that while greater learner independence might be increasingly required as an outcome of programmes designed to promote transferability (BT, 1993), it may be necessary to pay attention to the development of learners' thinking and learning skills if they are to become independent and autonomous learners. Given this proviso, however, great benefit can be gained from the learner being more in control of her or his own learning (Long, 1990; Hammond and Collins, 1991).

A study of 'Training for skill ownership' (Hayes et al., 1983) in England and Wales advocated setting up learning programmes, which made maximum use of trainees learning how to 'find out'. They highlighted the need for skill ownership to be re-oriented from the organisation to individuals. Companies, too, have been paying attention to the need to develop learner independence within programmes of work-based learning. One role for trainers is to ensure there are opportunities for reflection within such programmes so that individuals become more effective at acquiring methods of self-learning and techniques for individual development (Infelise, 1994).

7. Teamwork and collaborative learning

Changing skill mixes and the development of multi-skilled or interdisciplinary teams require skilled workers to work more intensively with others (BT, 1993). Hence being able to operate as a member of a team is becoming increasingly important at work, and the support of others at work can frequently be decisive in the learning of individuals. Infelise (1994) highlighted how large companies in France, Germany, the United Kingdom and Italy made use of group-based project work, action learning and learning while working in organised work-based learning programmes. There are increasing examples of where, because learners were working in teams at the workplace, these teams became a focus of support for learning (Infelise, 1994; Dankbaar, 1995; Nyhan, in this publication).

Knasel and Meed (1994) suggest the value of teams in their support and encouragement of learners relates to how:

- they provide opportunities for people to share their skills and experience;
- they provide a forum for exchanging information and generating ideas;
- within a supportive team people would more readily give each other advice, guidance and feedback in an unthreatening manner;
- above all a team – with its defined membership, shared sense of purpose, consciousness of being a group and interdependence – can offer the kind of enjoyable, rewarding environment in which learning is more likely to happen' (p. 45).

The extent to which this is feasible depends either on how work is structured at the workplace (Pettigrew et al., 1990; Keep and Mayhew, 1994) or upon a readiness to set up activities for learners to learn and work as a group. Encouragement of cooperative learning can be seen as an important strategy for tutors or mentors to adopt, and it is important that learners should learn to value collaborative learning and working relationships and recognise the value of the experience of others. Sanches (1992) points to the way that group-based problem solving helps learners develop reflective thinking skills and their capacity for self-regulation, as well as increasing the likelihood that they will transfer what they have learned.

The value of group projects in developing the skills of working with others has been demonstrated in a number of contexts (FEU, 1985; Boud et al., 1991), but the problem is that time for group reflection may be seen as 'soft' and be sacrificed or severely curtailed in response to more pressing demands. Soden (1993) highlights that the most effective way of 'remedying thinking errors is to discuss them with someone else' (p. 18). Miyake (1986) also showed that during collaborative problem solving individuals were more likely to monitor their own thinking processes. Opportunities for working with others should be built into all learning programmes but, where relatively little working and learning with others occurs at work, it may be that the use of action plans, the development of individual training projects and learning contracts can give particular emphasis to supporting opportunities for working with others in different contexts.

The social context created by a cooperative approach can also enhance the motivation and commitment of the learners (Slavin, 1983). Blagg et al. (1994) see guided group-work as invaluable not only to develop teamwork skills, but also as: 'an important means of extending learning and understanding. Effective groups providing a 'cognitive scaffold' for others to climb and build on. Ideas, tactics and solutions, evolve in an iterative way enabling individuals to see possibilities which would otherwise have been unavailable to them' (p. 9). In this way collaborative learning can not only help individuals to transfer their skills, knowledge and understanding between contexts, but also expose individuals to different strategies for making these connections.

8. Integration of knowledge development with work-related activities

What is now required are more imaginative ways of integrating knowledge acquisition, problem-solving and key skill development in work-related activities, which are relevant to the workplace and meaningful for the learner. Achtenhagen (1994) and Hayes (1992) argue strongly that extended 'company' simulations can deliver such integration. Such simulations would have the potential for helping learners engage in a broader 'systems thinking'. Kauppi (1998) proposes 'ventures' as essential elements in integrating work and learning. 'Ventures' or projects, developed jointly between students and employers, provide a 'holistic and organised grasp of the work as well a new way of thinking and acting in relation to work' (p. 82). In this respect, there would appear to be *stronger* alignments with the development of problem-based learning (Boud and Feletti, 1991; Oates, 1998): it is learner-centred with the integration of subjects and skills into thematic blocks, coupled with the use of learning oriented work in small groups and with self-directed learning. Such methods would also be compatible with assessment processes that test knowledge generated from an analysis of practice (Atkins et al., 1993).

This approach accords with other aims espoused in this paper: the need for learners to develop thinking skills, critical reflection, the ability to transfer and to work in teams as a basis for high level performance in the present and in the future. Such an approach, however, needs to be aligned with practical and active work-based learning, concerned with current and future performance in a holistic approach to the development of capability and expertise. This in turn will require a more integrated and imaginative concern for learning and assessment in companies and other work organisations, drawing on, for example, group or project work and problem-based learning and assessment.

9. Effective work-based learning

The need to design learning programmes in order to develop transferability has been emphasised. However, such programmes can take place in a variety of contexts, so it is worth examining what type and combinations of learning contexts contribute to making work-based learning effective. One key decision will be the location of, and balance between, development of more specialised expertise and broader vocationally oriented knowledge. The diversity of both employers and of facilities of off-the-job learning providers makes it unwise to lay down any general rule. Frietman (1990), for example, shows that either simulation or authentic learning can be effective; which of these is more appropriate depends on a variety of circumstances.

Nieuwenhuis (1991) argues that there is not a single 'best' context, because effective training can make use of a variety of contexts. Rather it may be more appropriate to audit the learning opportunities available and the advantages and disadvantages associated with particular combinations of education, training, employment and community contexts. Knasel and Meed (1994) argue along similar lines: guidance should be given to practitioners which allows them 'to make informed decisions about the relative strengths and limitations of off-the-job, near-the-job and on-the-job experiences in relation to specific areas of learning and aspects of the learning process' (p. iii). It is also important to monitor what happens in practice, as 'work-based learning has the capacity to deliver an exceptionally challenging and rewarding learning environment. However, it can also produce sterility, where challenges are few and a series of mundane experiences lead to little learning' (Brown, 1992, p. 134).

Onstenk (1994) points to the need for workplaces to offer 'strong learning environments', where it is possible for learners to apply their developing skills, knowledge and understanding in different contexts. There are some obvious difficulties for some small companies in providing the full range of learning opportunities required for the development of a broad occupational competence. Training practitioners interviewed for a study undertaken in the UK strongly believed that organisational culture itself could be influential, whereby 'the *wrong* organisational culture would significantly inhibit effective learning' (Knasel and Meed, 1994, p. 17, original emphasis). In contrast, in an organisation with a long-standing commitment to learning, then it may appear natural that workers learn with the company (Brown and Evans, 1994). Pettigrew et al. (1988) saw the existence of receptive or non-receptive training contexts as influential upon the whole approach companies adopted to the development and management of their human resources.

While some small companies are reluctant to get involved in training and development (Keep and Mayhew, 1994), other relatively small or medium-sized enterprises are highly innovative, and particularly if linked into 'multi-firm networking processes' (Rothwell, 1993); they can offer very rich learning environments. The GOLO model project in Wilhelmshaven in North Germany has brought together networks of enterprises to offer collectively a broad range of learning opportunities for apprentices (Rauner, 1998). This project is now being extended to embrace cooperation between German-based enterprises and enterprises situated in Akron, Ohio, USA with the intention of offering an extended experience of working in different environments and practices. In such circumstances, work itself (and the survival of the company) is concerned 'with extending levels of organisational adaptability and flexibility and with developing new areas of knowledge and technological competence' (Rhodes and Wield, 1994, p. 168). The richness of the work/learning environment is such that knowledge and expertise rapidly develop through work, which itself is taking place in different contexts. In such circumstances great emphasis is given to possession of: 'a broad mix of skills ...required to achieve viable levels of flexibility in the development and delivery of products and services, and to sustain viable inter-firm networks' (ibid., p. 169).

It is interesting to note the considerable expectations small growing companies in central London (UK) had of new employees being able to learn while working from the outset. Rajan et al. (1997) point out, in a survey of 950 small and medium-sized companies in central London, that growing companies were likely to be moving towards a performance-driven business culture, with an emphasis upon empowerment, teamwork, lifelong learning and individuals managing their own careers. Graduates were 'reckoned to have intellectual and behavioural traits more in tune with the main elements of the new culture' (Rajan et al., 1997, p. 13), and as a consequence 'the growing companies in our sample have been recruiting a significant number of graduates in recent years in nearly three out of every five companies in our sample, more than 20 % of the workforce have graduate qualifications' (Rajan et al., 1997, p. 13). The training methods most frequently used with new graduate recruits were learning by doing; coaching by line managers; interacting with suppliers and customers; and carrying out significant work responsibilities.

While the central London labour market may be a special case in some respects, the development of skills through the exercise of responsibility, rather than through an organised preparation for responsibility, is probably typical of the wider UK labour market. Employers following this path could be regarded as developing the necessary additional qualifications of individuals, including at a level above that of the 'skilled worker', even though these qualifications may not be formally recognised. That is, these developments may be placed primarily within the 'organisational' space of company activities rather than within the formal 'qualificational' space, although there may be some variation according to the different approaches adopted by each of the respective individuals, companies or sectors. Indeed the employment of inexperienced 'over-qualified' young people (for example, graduates without appropriate specialist knowledge) could mean that they are over-qualified by educational level in relation to the specific job requirements, but simultaneously under-qualified in terms of their experience (Tessaring, 1998).

An alternative development may be seen in Germany where an increasing number of graduates are undertaking an apprenticeship following completion of their university course. Similarly an increasing number of apprentices have already achieved the *Abitur* qualification necessary in Germany for entrance to university and are undertaking an apprenticeship prior to a university degree. However, Drexel (1997) points to the problems of overqualified graduates blocking the traditional promotion pathways for apprentice trained skilled workers and thus acting as a disincentive and barrier to continuing education and training for this group. A model project in 'Schwarze Pumpe' in Brandenburg has been designed to provide apprentices with a dual qualification, as a skilled worker and with the academic qualification for entry into higher education. The project has involved bringing together companies and vocational schools to utilise the workplace as an opportunity to practice the theoretical learning and to align the school-based learning more closely to opportunities for project development in the enterprise (Bremer, 1995).

IV. *Models for continuing professional development*

Our analysis of the challenges facing vocational education and training in Europe and our survey of good practices in the different Member States have impressed on us the need to develop models for continuing professional development which can bring together initial and continuing education and training and provide a common basis for the development of effective learning programmes and for systems development. The model should be based on the development of new knowledge through the application of expertise. Such a model needs to be robust at the level of pedagogy and design whilst providing the flexibility for its implementation in different cultural and social settings. The model we present here has been developed in the context of a Leonardo da Vinci project for the education of vocational teachers and trainers (Europrof) (Attwell, 1997).

Whilst models of professional development have been more traditionally associated with white-collar professionals rather than blue-collar occupations we believe such a model would be appropriate for the development of expertise throughout the whole occupational spectrum. However, we believe there is a need for a major focus on the piloting and evaluation of the model as a contribution to a further development of skills and knowledge in Europe in the light of the present and future challenges we have explored.

The continuing professional development (CPD) of professionals has to be reflective, forward-looking and dynamic. It needs to equip professionals with the ability to support the development of skills, knowledge and understanding of others as well as of themselves, in a commitment to lifelong learning, as well as seeking to accommodate requirements for complexity and flexibility. The size of the task is daunting, and is achievable only with a strong and increasing commitment to continuing VET and professional development within a culture which acknowledges the importance of developing practice, expertise and a research capability in an inter-related way (Brown, 1997), and enables support for the generation of new forms of knowledge (Engeström, 1995) in all their dimensions.

1. Communities of practice

The continuing development of professional communities of practice needs to incorporate current concerns, but also have the ability to look beyond these, and this is possible only if, as Ellström (1997) argues, practitioners develop a broad developmental and interactive view of competence. This would complement a focus upon the significance of work-related knowledge and work process knowledge in the continuing professional development of professional communities of practice.

2. Developing practice

Initial competence as a professional is often associated with the ability to survive and gradually assume a full position within particular 'communities of practice' (Lave, 1991). However, practitioners need to have a continuing commitment to explore, reflect upon and improve their professional practice (Schön, 1983; 1987). This in turn means that practitioners have to continue to develop the necessary understanding, skills and knowledge to evaluate and review their professional practice and expertise, recognising that this often takes place in complex and dynamic contexts.

Indeed practitioners have increasingly to be able to manage continuing change in aspects of their practice and in the contexts within which their practice takes place, as well as coping with the complexities inherent in the teaching and learning processes of their CPD. This adds further impetus to moves whereby the competent professional is seen as a 'reflective practitioner,' able to respond to professionally problematic contexts through 'reflection in action' (Schön, 1987). The essence of competent practice is that the practitioner is able to respond intelligently in situations which are sufficiently novel that the response has to be generated in situ (Elliott, 1990).

It is thus important that continuing professional development does address the idea of supporting the development of practice. The concept of work-based learning (see above) has been used as a key component of continuing professional development, although sometimes this relies heavily on individualistic processes of reflection (Winter and Maisch, 1996). Eraut (1994) raises the question, however, of whether successful workplace practice can necessarily be equated with a capacity to understand the ideas and concepts that inform such actions. It is therefore clear that ideally work-based learning needs to have a strong collaborative dimension and to ensure that significant intellectual development also takes place in reality. The whole approach of communities of practice therefore has much to recommend it not least because of the way it stresses the collaborative dimension to learning (Lave and Wenger, 1991). One way of raising the intellectual demands associated with work-based learning is to make use of problem-based learning where the focus is upon core problems of groups of practitioners (Onstenk, 1997), acknowledging the contribution theoretical concepts can make to assist individuals to understand what they are doing and why work practices are subject to change (Engeström, 1995).

3. Developing expertise

The initial key to going beyond competent practice lies in the ability to transfer skills, knowledge and understanding from one context to another (Eraut, 1994), so continuing professional development has to be able to support this process, including through helping practitioners to perform effectively when they work with colleagues and in groups with different kinds of expertise (Engeström, 1995). Guile and Young (1997) argue that increasingly professionals need to possess a connective, rather than an insular, form of specialisation, which stresses the ability to look beyond traditional professional boundaries.

Another aspect of developing expertise lies in the ability of the professional to handle the complexity and inter-relatedness of issues. This has at least three dimensions. One is the form of the representation of knowledge structures into mental models (Soden, 1993) or networks (Simons, 1990), which are capable of handling the increasing complexity and inter-relatedness of issues. The second dimension relates to the way an individual is able to hold and inter-relate ideas from different spheres (practice, research and theory) to get a fuller, deeper and contextualised understanding of professional issues. The third dimension then revolves around the capability to apply that contextualised understanding to particular situations and, if appropriate, to translate that understanding into action.

There is clearly not a precise moment when one can identify a shift from 'competent practitioner' to 'expert', not least because it requires a degree of self-acknowledgement as well as recognition by others. Expertise rather lies at the conjunction of research, theory and practice, and practitioners need to be reflective upon their own reflections in action as well as upon their own actions (Schön, 1987). This means that an individual will be able to engage in processes of analysis and critical reflection, such that he or she is able to build understandings, interpretations and explanations, and to test these against other research and theory as well as against practice. A further test might be whether the individual can communicate her or his understanding in such a way as to convince others. In such an interpretation the ability to be able to create new knowledge is significant (Engeström, 1995), and therefore in order to develop expertise it is important for practitioners to develop their research skills and be able to apply them to their professional practice. In this sense, expertise is itself partly generated through research and investigation.

It should also be noted that understanding and, if appropriate, application of theory has a role to play within developing expertise. While the value of practical theory or 'theorising' in the sense of reflecting upon his or her own practice is central to the process of becoming an experienced professional (Schön, 1987), this on its own is insufficient. Rather because it is locked into current modes of practice, it is important that 'theoretical learning' is also developed (Guile and Young, 1997). Theoretical learning provides concepts for analysing problems that arise at work and for making explicit the assumptions underlying existing practice (Guile and Young, 1997). This conceptual knowledge can then be used to underpin reflection upon practice at a deeper level than just 'theorising' practice. Such conceptual knowledge can have both explanatory power and be applied to (changes in) practice. It therefore complements the development of practical learning, based upon an individual's, or a collective, reflection on practice. Crucially, however, the development and application of theoretical learning facilitates a forward-looking perspective: enabling thinking about how practice might be developed in future.

4. Developing a research capability

Teaching and nursing are recent examples of professions where there have been explicit attempts to move more towards making these research-based professions, where practice is not only informed by research, but new knowledge about practice is being generated by the professionals themselves. Whilst these may be regarded as professions and not occupations, Fischer (1996) has developed an expert system for the continuing professional development of maintenance engineers which similarly utilises the development of new knowledge through applied research. This entails explicit recognition that practitioners have a key role to play in how new knowledge is both generated and applied in practice (Engeström, 1995). Further, this could be linked with an attempt to create wider communities of practice that embrace research as a guide to both policy and action (Brown, 1997).

The design and carrying out of authoritative research into aspects of professional practice individually or as part of a team is becoming an integral part of practitioners' competence. However, possession of research skills will also be valuable in helping professionals to analyse, interpret, evaluate and, if appropriate, to apply research findings of others. The possession of a research capability could therefore be used as a tool to create new forms of knowledge and to assist in the transformation of existing communities of practice.

5. The ability to communicate effectively

Personal change and development are central to the educational process. All professionals have to be receptive to challenges to their ideas and existing patterns of thought and action. Reflecting upon and responding to change will also involve complex social processes in which the ability to communicate effectively is essential. It may be that the development of some communication skills is particularly well-suited to a telematic environment: for example, the ability to give constructive feedback, be an effective listener and engage in reflective summarising are all skills, which are often under-developed, even though they underpin effective communication in a range of contexts, and can be central to telematic conversational processes. Indeed the telematic environment could be explicitly used to support the development of communicative competence, in a way it could open up the possibility of more democratic dialogues (Habermas, 1974).

6. Inter-relationships

Professional knowledge can itself be regarded as a personal synthesis of received occupational knowledge and situational understandings, derived from experimental learning, which are capable of being further transformed through a process of critical reflection (Hammond and Collins, 1991). As expertise develops, and new contexts are utilised in the performance of practice, so the processes of research, review and reflection can lead to the creation of new forms of knowledge (Engeström, 1995). Continuing professional development can play a role in making these processes explicit such that others too can share in the developmental process. Hence continuing professional development has at its core a number of inter-related commitments. The most obvious is a commitment to personal development. The others include:

- exploration of, reflection upon and improvement of professional practice;
- development of skills, knowledge and understanding as well as critical reflection necessary to evaluate and review professional practice;
- need to understand processes of change, as practice increasingly takes place in complex and dynamic contexts;
- ability to create new knowledge;
- development of theoretical knowledge to underpin and complement reflection upon practice.
- study of the interplay between theory and practice;
- need to be able to transfer skills, knowledge and understanding from one context to another;
- the generation of expertise through research;
- ability to handle complexity and interconnectedness of issues (including through the formulation of mental models, schemas or networks);
- development of contextualised understandings;
- translation of understanding into action;
- further development of communication skills;
- attempt to create a wider community of practice that embraces research as a guide to both policy and action;
- ability to design and carry out authoritative research into aspects of professional practice;
- ability to analyse, interpret, evaluate and, if appropriate, apply the research findings of others.

The type of continuing professional development outlined above can be facilitated in a number of ways, but increasingly computer-mediated communications (CMC) could be utilised to provide a collaborative, reflective and 'dialogical' environment within which forward-looking continuing professional development could flourish. However, whether CMC is utilised will depend, at least in part, on the quality of the tools and processes which are intended to support communication and collaboration. Attention should therefore be turned to the extent to which CMC can provide a suitable environment to support CPD in professional communities of practice. This will entail a considerable further research effort, both into the efficacy and appropriateness of the model, and the ways in which it might be utilised in the development of new competencies and skills, learning programmes and situations.

V. *Recommendations and concluding remarks*

1. A focus on learning

One key message for those charged with designing effective learning programmes for the development of transferability is that the prime focus of the inter-relationship between education, training and employment needs to be upon learning. It will be important to address issues of learner motivation and seek to ensure learners are given opportunities to improve their learning to learn skills and that a sufficient range and quality of learning opportunities are available to develop their key or core skills and competencies. In particular, if the intention of a learning programme is to help learners develop the ability to transfer skills, knowledge and understanding, then learning contexts are required which draw attention to the significance of skill transfer. Processes of review and critical reflection are pivotal for this. Organised reflection on what has been learned and what needs to be learned in future can act as a bridge between working and learning, and as a bridge between the skills that are currently required and those that may be needed in future. Such reflective processes link into the development of more elaborated thinking processes that underpin the ability to transfer knowledge, skills and understanding.

More generally, learners should be encouraged to make their thinking approaches explicit, through discussion with tutors, coaches or peers. These discussions should examine their approach to tackling problems in their occupational area, and the extent to which they are developing networks or schemas in order to develop further their understanding of concepts and relationships in their respective contexts and in the environment as a whole.

2. Learner independence

The development of learner independence, too, is an important goal as learners need to take increasing responsibility for their own continuing learning across a range of settings. Similarly being able to learn and work in teams has become more significant in a variety of contexts. Learning programmes should thus provide opportunities to develop these skills. It might be thought that the attention upon the process skills underpinning the ability to be effective in different contexts might result in the development of a substantive occupational knowledge base being downplayed. However, this is not the case. Rather the development of process skills ideally should be embedded in appropriate occupational contexts. Further, the development of a substantive knowledge base is important because it is central to the development of domain-specific expertise and because it forms a platform for continuing learning in the future. It should be remembered that the ability to master a substantive knowledge base is itself a process skill, which ought be valuable in a variety of learning and working contexts, especially in those where organisations require individuals to contribute to processes of knowledge creation, development, transmission and diffusion or adaptation.

3. Learning contexts

The design of effective learning programmes to develop transferability needs to draw upon a variety of learning contexts, and designers need to be aware of the strengths and weaknesses associated with particular combinations of education, training and employment contexts. The quality of learning environments in companies can be quite variable, as organisational cultures can either inhibit or promote effective learning. Similarly, patterns of work may be organised in such a way that practice and expertise can be further developed through a productive combination of working and learning for both young people and the adult labour force. In order to make the best use of less favourable learning environments at work, it may be useful to use work-based projects, individual learning contracts and action plans in order to enhance and enrich work-based learning and to make it applicable to contexts beyond the immediate work environment.

4. Concluding remarks

Those designing learning programmes in vocational education and training should pay particular and increasing attention to promoting skills and competencies in such a way that learners are readily able to transfer what they have learned between a whole range of different contexts. Individuals should be equipped to contribute to processes of individual and organisational knowledge development and utilisation in companies which, if dynamic, are increasingly offering working environments with considerable opportunities for learning while working.

The paper has indicated an increasing alignment between changing patterns of vocational education and training and changing needs of work environments and enterprises in Europe, whereby it is likely that practitioners from both contexts would agree upon the essential developmental tasks for young entrants to enable them to function effectively in dynamic work organisations, which are operating in knowledge- and information/communication-intensive environments. These would include development of the ability of learners: to transfer what they have learned between contexts; to contribute to their own and other's permanent knowledge creation and development; and to engage in processes of organisational knowledge and development.

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B. Continuing vocational education and training – initial responses to trends in occupations and qualifications (¹)

Hartmut Seifert (²)

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Summary and outlook

The premise of this study is that the structural transformation to a service-and-knowledge society will result in new demands on vocational qualifications and continuing vocational training. Focusing on these challenges, the study describes the foundations of continuing vocational training in Germany, as they no doubt also exist in most other EU Member States: company activities and related wage agreement provisions for continuing vocational training, continuing training legislation and public funding of continuing training as a labour market policy.

The study demonstrates that the various sectors are at best only just beginning to coordinate their activities. The links between in-company and out-of-company training activities are weak. There is no guaranteed continuing training entitlement in either the in-company or out-of-company sector. Moreover, both sectors are selectively targeted at privileged social groups. The less qualified are largely excluded and lose touch with fast-changing qualification requirements. For this reason they have little chance of reintegrating into the labour market.

To make things even worse there has in recent times been a marked decline in continuing training activities in both the in-company and out-of-company sectors, despite increased demand and objective requirements.

If our vision of a knowledge society is to come to any sort of fruition, lifelong learning must become the norm for practically all working people. With this stipulation in mind, what is needed is a reform of continuing vocational training which lays down a universal training entitlement, provides the corresponding training structures and undertakes to coordinate and synthesise the activities of companies and public providers. We envisage a closer relationship between working and learning and new collective agreement and working-time models which make provision for continuing training (possibly involving a further reduction in working hours linked to compulsory continuing training participation, the rotation of staff between work and continuing training, etc.). These things must be realised if we are to adapt successfully to current and foreseeable developments in the supply and demand of occupations and qualifications, and if continuing vocational training is to become truly effective and more than just a stopgap.

(¹) Study to appear in the Ciretoq handbook on 'European Trends in Occupations and Qualifications'.

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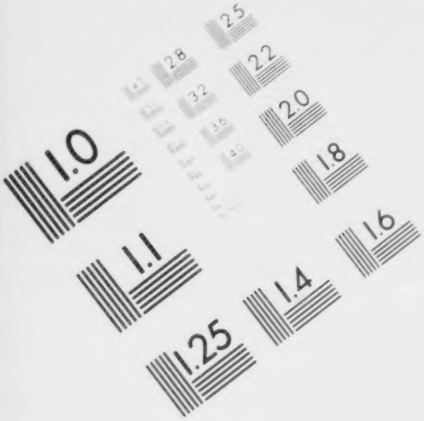
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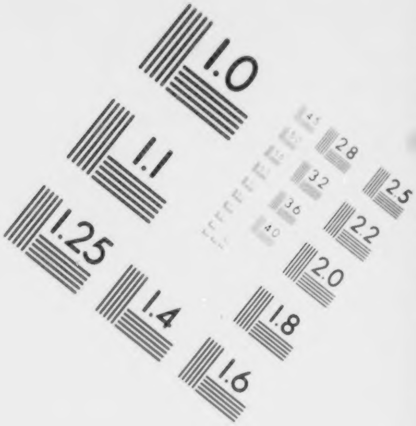
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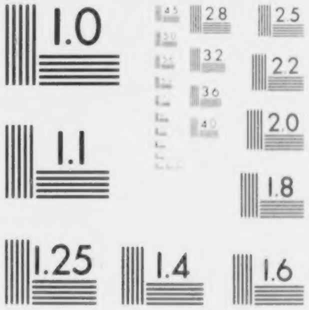
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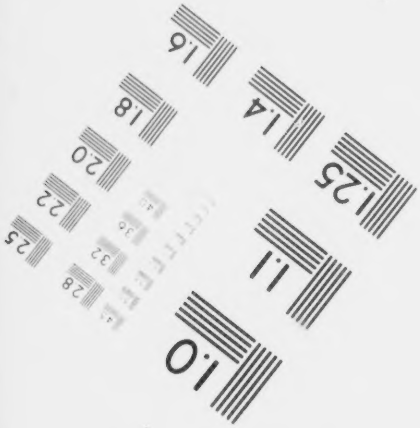
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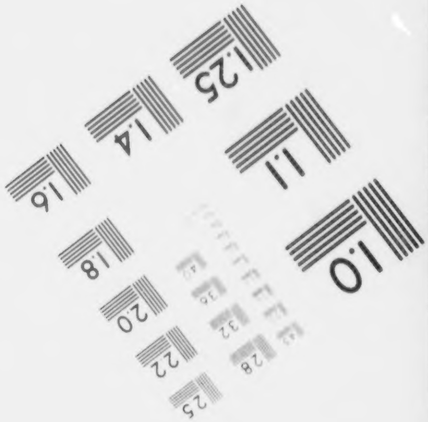
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1. Introduction

We are faced today with a fundamental structural change from a goods-producing economy to a service-oriented information-and-knowledge society, accompanied by swift growth in the use of information and communication technology and increasing internationalisation or globalisation. Vocational training and continual vocational training are seen as crucial for future economic success, ensuring competitiveness as well as social and economic cohesion. Key considerations in this context include maintaining employability, reducing periods of superficial knowledge, and lifelong learning.

According to the new growth theory (Lessat 1994), training and continuing training costs represent the decisive variable as a non-physical investment factor. Developed economies will be able to sustain their high standards of living and growth rates in the long term only if they succeed in organising the process of ongoing continuing vocational training, creating the necessary facilities, infrastructure and institutional requirements and providing financial resources. Education and continuing training are considered the fuel for growth, high employment and affluence. Continuing vocational training must become a focus of attention for the State, the economy and trade unions, as well as job seekers and workers themselves.

Although in principle there is widespread consensus in society on the importance of continuing vocational training, in almost all EU Member States this status is not reflected by the range and quality of existing training programmes. The latest research in fact points to trends in the opposite direction. In Germany at least, a certain restraint is evident with regard to continuing training programmes in both the public and private sectors. Yet irrespective of these restrictive trends, which may possibly be attributable to economic or political factors, at the same time new concepts and approaches are being tested which can be grouped together under the catch-phrase 'More training, fewer lay-offs'. These are discussed in more detail below.

2. The current situation

Over the past few years a noticeable trend towards higher qualifications in western Germany has become evident. Over the same period the number of redundancies among unqualified workers has been disproportionately large. A higher level of qualification reduces the risk of redundancy and of long-term unemployment, and vice versa. With an overproportionate decline in the demand for unskilled labour, training can in general only improve one's chances of reintegration into the job market.

This qualification-related structural change affects all areas of the economy, both the manufacturing sector and the service industry. The tertiarisation of the economy does not signal an end to the established trend in the industrial sector towards greater demand for more highly qualified workers. Long-term scenarios suggest that the trend towards higher qualification requirements will continue. Correspondingly the demand for unqualified labour will drop even further. Estimates indicate that the proportion of unqualified workers on the labour market will drop from the 20 % level of the early 1990s to around 10 % by 2010 (Tessaring, 1994, p. 10).

This prospect has given rise to new debate on the importance of qualifications. A commission on the future of labour organised by the two German *Länder* Saxony and Bavaria has forecast a swift economic structural transformation from an employee-centred industrial society to an entrepreneurial knowledge society (Kommission, 1997, p. 44). In this new society work effectiveness will no longer be the key factor determining market position and income level. More significant will be the scope and marketability of knowledge and capital. Knowledge and skill determine a country's prosperity (Kommission, 1997, p. 45). Thus, what really matters is promoting independent knowledge-acquisition skills (lifelong learning), creative development of one's own talents and the ability to adapt these skills and abilities to prevailing job market conditions. Another core skill is the ability to cope with uncertainty in a complex, fast-changing world.

With these development prospects in mind, strategic learning and ongoing continuing training take on central importance. As businesses concentrate more and more on their core competences, qualification goals are shifting 'from satisfying a predefined demand for individual jobs to optimal, highly integrated knowledge management, meaning organisation of knowledge and skills and the ability to adapt and upgrade them' (Pawlowsky, 1998, p. 35). General cognitive and practical capabilities and performance need to be developed above and beyond specialist skills and knowledge. These changed qualification requirements will affect broad sections of the economy and many future fields of work. The thrust of continuing vocational training up till now has been highly selective and many categories of workers have been excluded. In view of the expected structural change to a knowledge society this seems inadequate. Continuing training will only be able to meet future needs if we succeed in shifting its emphasis to constant updating of qualifications for all.

3. Foundations of continuing training

Continuing vocational training in Germany, as in other EU Member States, is the responsibility of a number of different institutions, including private and business organisations as well as governmental bodies. They vary in their aims, facilities and range. They conduct different, partly complementary, partly overlapping activities. It would be mistaken, however, to think of them as constituting a system of coordinated subsystems. (1) First and foremost, there are the companies or enterprises who, as providers, organisers and financiers, determine the scope and content of continuing vocational training and who upgrade the qualifications of their staff in response to technical or organisational changes in their own operations. (2) In addition, numerous collective wage agreements guarantee workers a right to in-company continuing training under certain conditions. (3) Training leave laws give workers in various German *Länder* the possibility to attend continuing vocational – but also general – training programmes.

The regulations of the labour promotion law (AFG), most recently amended in 1997, as well as the tools and resources made available by European social funds, help businesses and the unemployed to adapt their vocational qualifications to changing structures in the economy and offer support in particular to disadvantaged target groups and the unemployed. Various parties are involved: the federal government, individual *Länder*, the European Commission, businesses and individual employees. They differ not only with regard to their respective activity levels, but also in their specialist functions, goals, target groups and financial resources (³). Bearing these factors in mind, we must ask to what extent each of these vocational training areas displays a readiness to meet future demands.

3.1. In-company continuing training

Enterprises and businesses are themselves important continuing vocational training providers. They carry slightly more than half of the total costs of continuing vocational training. The main emphasis of in-company training activities is adapting labour to changing company qualification requirements in response to technological development or modifications in the organisation of labour, such as the introduction of team work, hierarchy reduction, partially autonomous work organisation, etc. Vocational retraining plays only a marginal role in in-company continuing training programmes. The question of the degree to which in-company continuing training qualifications can serve as base qualifications in the wider context of structural change beyond individual enterprises remains unanswered.

The latest surveys conducted by an IAB company panel show that almost one in every five employees took part in an in-company vocational qualification programme in the first half of 1997 (Düll and Bellmann, 1998). In western Germany (18 %) the level was slightly lower than in eastern Germany (22 %). In-company continuing training activities are spread widely across economic sectors. They vary also ac-

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(³) The total expenditure on continuing vocational training in 1995 stood at DEM 70 100 million. 56.7 % of this came from the private sector, 21.1 % from the Federal Labour Office, 15.3 % from training participants and 6.7 % from the public purse (Bundestagdrucksache 1997, p. 35).

cording to the size of the company and the qualification level of the employees (Düll and Bellmann, 1998). The financing and insurance sector is the most training-intensive, followed by the mining/energy/water sectors, while the catering/accommodation/cleaning sectors are found at the bottom end of the scale. Both small and large-scale enterprises are more active in continuing vocational training than medium-sized ones. There is a clear segmentation with respect to qualification levels. Whereas only 7 % (western Germany) and 9 % (eastern Germany) of unskilled and semi-skilled workers took part in training programmes in 1997, the levels among qualified staff and civil servants stood at 29 % and 36 % respectively. Those who benefit most from continuing training are the already highly qualified, hence the qualification gap grows wider and wider in the course of a working life.

In recent times new trends have been emerging in in-company continuing training. Firstly, businesses are tending to transfer greater sections of continuing training from employees' working hours to their free time, in this way cutting ongoing wage-payment costs (IW, 1997). Whereas in 1992 80.5 % of participants' training time was considered working hours, three years later it was 78.2 %. Secondly, the proportion of externally conducted programmes has dropped in relation to in-house training. And thirdly, 'softer' training forms have become more important. These include above all close-to-the-job instruction by superiors, information sessions and various forms of self-regulated learning (reading, distance learning, computer programs, etc.).

In view of these developments it is hardly surprising that between 1992 and 1997 total company spending on in-company continuing vocational training dropped a good 7 % (IW, 1997, p. 17). In real terms the reduction is much greater. Total company costs were equivalent to about 1 % of gross domestic product. We must remember, however, that continuing vocational training costs can be estimated only roughly. The figures can be very different according to whether we consider the actual costs or the opportunity costs, as the latter method (the one on which the above figures are based), in contrast to the former, includes wage payments during continuing training (Schumacher, 1997, p. 245). Furthermore, there is no strict definition of what exactly constitutes a continuing training programme. There is often a fluid boundary between 'softer' close-to-the-job forms of continuing training and ordinary working activity (Grünewald and Moraal, 1996).

3.2. Collective agreement regulations

Vocational training and continuing vocational training have over recent years become more important as factors in the drawing-up of collective agreements. Yet as far as regulations are concerned, they still lag well behind traditional social partner issues such as wages, working hours and working and performance conditions. There are no national continuing vocational training regulations which cover all occupational groups without exception and which guarantee a general entitlement to continuing vocational training.

Most existing regulations on continuing vocational training matters, settled at sector-level between employers' associations and trade unions, are closely linked to other regulation issues. They occur mainly in connection with agreements on job (rationalisation) protection. Qualification issues are also a factor in agreements on positive action for women and in regulations which facilitate coping with both a family and a career. This context dependence indicates that it is less a question of continuing training goals in the true sense than of regulating business, sectoral or occupation-specific conditions to which continuing training is connected. At the in-company level we have only recently been able to observe moves towards securing entitlement to general and continuing training above and beyond any specific context or particular occupational group. These moves can be seen as harbingers of future national collective agreements at the sectoral level.

An appraisal of existing collective agreements offers the following picture (Ochs, Seifert, 1994): in collective agreement regulations, continuing training entitlement is most often linked to job (rationalisation) protection agreements. They guarantee employees whose positions are threatened by technological or organisational rationalisation the right to participate in retraining programmes which prepare them for a new occupation. Such programmes may last up to two years and are financed by the companies, with the costs in some cases partially covered by compensation benefits. Training rights linked to rationalisation protection pertain not only to retraining, but in certain cases also to further training or induction programmes. Company-financed continuing training programmes are aimed almost exclusively at in-company qualification needs. Only two collective agreements (in the printing and textile industries) provide for the eventuality of implementing programmes financed via the labour promotion law (AFG of 1969) or the labour promotion reform Law (AFRG of 1997) and lay down corresponding procedure regulations for cooperation with the Labour Office.

In most rationalisation protection agreements, employers undertake to cover all costs related to continuing training, including transport costs, to the extent that no third parties are involved in the financing. In some smaller collective bargaining areas there are regulations for a training fund administered jointly by the parties to the agreement and financed jointly by contributions of employers and employees. Generally the employee continues to receive his average wage for the duration of training. Employers have a right to demand compensation should the employees break off training with unfulfilled obligations.

The Shell AG company agreement, adopted in 1988, is still an exception in the collective bargaining arena. It breaks new ground by combining working-hour reductions with continuing vocational training. The collectively agreed working week was shortened from 40 to 39 hours. Employees were given the option of using the extra hour as either free time or training time. In addition to its regular staff training programme, the enterprise introduced a new programme for its employees under the motto 'The company supplies the money, the employees supply the time'. The enterprise covers all instruction, trainer and resource material costs. In addition to time units gained from the reduction in working hours, employees can also collect time credits from overtime or flexitime and use this time for training programmes. In this way every employee has in principle the opportunity to make use of the continuing training on offer.

Since the introduction of general continuing training time the number of employees participating in continuing training has almost tripled among those who come under this company wage agreement. Approximately 25 % of staff choose to participate in the training programmes offered rather than just use the reduced working hours to finish work earlier. Programme content covers a broad spectrum, including computer and language courses, educational and methodological training issues and courses on industrial law.

3.3. Training leave legislation

Training leave laws in Germany come under the jurisdiction of the individual *Länder*. To date 10 of the 16 *Länder* have passed training leave laws which guarantee all employees in the respective regions a legal entitlement to training leave. The universality of the right to training is the key aspect of these training leave laws.

Training leave gives employees the opportunity to participate in political, social and vocational training programmes. The aim of political training is to inform employees about its function, rights, legal and social status as well as its role in affairs of State. The aim of continuing vocational training is to maintain and improve qualification levels and to promote occupational mobility. Individual *Länder* laws stress that continuing vocational training should not be limited to the work a person has performed in the past, but should also include the teaching of core skills and orientation knowledge. Entitlement conditions envisage five days of paid leave annually.

This can be taken in a block of 10 days or two weeks over a two-year period. The right to participate in a recognised training programme goes hand in hand with continued wage payment. The costs of the continuing training itself are carried by the participants. These mainly include course fees, lesson materials, travel to a training institution, etc.

The proportion of workers entitled to training leave who actually make use of it is estimated at about 2 % (Bundestagsdrucksache 1997, p. 10), in some *Länder* even less than 1 %. Not all continuing training activities promote continuing vocational training directly. Estimates put the figure at about half of all continuing training. Despite the relatively low participation rate, employers' associations are in favour of the training leave laws being repealed. Their primary concerns are the high costs to companies, the absence of a specific vocational basis and what they see as too much scope for abuse for non-vocational purposes.

3.4. Publicly funded continuing training

Continuing vocational training is one of the central responsibilities of labour market policy, regulated since 1969 by the labour promotion law (AFG). Funding is aimed at the public labour market and thus covers an area not reached by either in-company programmes or training leave laws. The subsidisation of in-company continuing training is not among the objectives of labour market policy. With unemployment on the rise, the proportion of potential labour covered by in-company continuing training is shrinking. The number of those who could benefit from public continuing training is growing at the same rate.

The AFG originally distinguished between further vocational training, vocational retraining and in-company induction. This became largely redundant when the third version of the Social Code (SGB III) came into effect on 1 January 1998. In the SGB III the concepts of 'further training and retraining' are grouped together as 'continuing vocational training'. The financing of in-company induction is continued in the form of assimilation allowances.

Continuing training can also be sponsored in connection with work creation schemes or short-time work (see para. 4.1). In work creation schemes training can occupy up to 20 % of working time. Employees contributing to compulsory insurance coverage are entitled to continuing training subsidisation if they become unemployed or are threatened by unemployment and if they need continuing training in order to be reintegrated into the workforce or to prevent them from becoming unemployed. The training allowance corresponds to the unemployment benefit and is equivalent to 67 % (for married persons with at least one child) or otherwise 60 % of their net wage earnings. The emphasis of State-sponsored continuing training until now has been so-called refresher training, which in 1996 accounted for more than three quarters (76.7 %) of all participants. The aim of refresher training is to maintain, develop and adapt occupational knowledge and skills to new qualification requirements resulting from technological and organisational change. By comparison vocational retraining plays a subordinate role with only 18.1 % of participants. These programmes are aimed at providing a new vocational qualification. They usually take a relatively long time to complete (around two years) and involve considerable staffing and financial demands. In-company induction programmes and vocational advancement support have dropped away over the last few years as a consequence of changes to sponsorship criteria and the introduction of the 'advancement training law' as a near-substitute giving middle management new training rights.

Over the last few years there has been a sharp decline in State-sponsored continuing training. The number of participants in 1997 (863 000) was less than half the 1992 figure (431 000). In view of rising unemployment the decline seems even more dramatic. The quotient of these two figures has fallen from 29 % to 9.8 %. In other words, measured against the level of unemployment, continuing training intensity has dropped to a third of its original level over the last five years. Labour market policy has become much less effective in reaching its target groups – the unemployed, and especially the long-term unemployed. Their chances of reintegration are greatly diminished and they are falling further and further behind the changing qualification requirements of businesses.

4. Innovative approaches – more training, fewer lay-offs

In the context of the ongoing employment crisis, various isolated cases point to a shift in company staffing policies. More and more companies see training programmes as an alternative to staff lay-offs, preparing employees threatened by redundancy either for a different position within the company or for the external labour market. Such approaches are getting impetus from newly introduced labour market tools. In this context the combination of short-time working and public funding of continuing training is one structural policy alternative to lay-offs.

4.1. Short-time working and continuing training

In 1988 the legislature added another tool to the labour market inventory in the form of structural short-time working which can simultaneously be used for continuing vocational training. Previously it was only during economic crises that it was possible to offset demand and declines in production with short-time working, but without investing the lost working time in publicly funded continuing training.

Short-time workers receive payment equivalent to 67 % of their last net wage (or 60 % for unmarried persons without dependent children) for the lost working time. The latest amendments to labour market policy make it possible to combine continuing training and short-time working prompted by cyclical trends. In this way the government has taken into account the virtually insurmountable problem of distinguishing strictly and *ex ante* cyclical and structural employment problems.

The linking of the two tools is innovative in so far as conceptually it represents an attempt to grapple with employment crises by other means than just increased spending. Other goals include promoting a proactive approach to structural crises, helping companies to avoid lay-offs either by switching to new products or new production processes or by promoting external structural change, improving employment prospects of those threatened by redundancy in order to make the transfer to a new job, occupation or economic sector – whether within the company or without – as seamless as possible.

The 'AFG-Plus' programme launched in 1995 represents a further development in the combination of short-time working and continuing training. The most important innovation is that resources from the European Social Fund can be utilised for conducting continuing training programmes during short-time working. Since the beginning of 1997 employers are entitled to reimbursement of social security contributions for the lost working time. A prerequisite for financial assistance is that the training of short-time workers will facilitate adaptation to structural change or new production systems. The first priority must be training employees threatened by unemployment. The employer is also obliged to contribute to the financing of the qualification programmes.

Up till now there has been only a limited response to the new opportunities for using periods of short-time working for continuing vocational training. Most recently (second quarter of 1997) just under 100 enterprises were running continuing training programmes for short-time workers. The number of workers undertaking training during a period of shortened working time was just under 5 000. This is a good 3 % of all short-time workers. The increase in funding options resulting from the availability of ESF resources has led to a slight growth in this figure, but by no means to an explosion.

The limited utilisation of short-time work for continuing vocational training to date can be ascribed to the difficulty of planning the scope and duration of short-time working, the costs to the company despite public funding and a lack of modular training concepts (Deeke et al., 1997, p. 132 f.). Recurring periods of short-time working, the length of which it is difficult to predict in advance, can be more easily utilised for continuing vocational training if complex training programmes are divided into different building block-like modules. Each module represents a complete training unit in itself, but is complemented and extended by the others.

Although the significance of short-time working linked to continuing training is in quantitative terms still only slight, developments in the coal-mining sector provide an excellent example of an innovative model for continuing training aimed at structural changes outside the company. For decades this sector has been forced to cope with dramatic structural changes and it is expected to contract even further over the next few years as a result of political decisions which have already been taken. In order to make staff threatened by redundancy aware of alternative employment options outside the company various parties have joined forces and started a placement and training campaign called the 'craft trade initiative' (4).

The craft trade initiative offers coal-mining workers the chance to spend up to six months with other companies, principally in the craft trade sector. Here they can test whether the new field of work meets their expectations, whether they have all the necessary vocational qualifications and whether they require any additional training for the new job. These occupational trial periods with other companies can also be used to rectify workers' qualification deficits by means of specific qualification and training programmes. The worker's contract with the old company remains valid for the duration of the trial and qualification period. The workers also continue to receive all allowances and social benefits they are entitled to under collective and other wage agreements with the old company. Technically the workers are on short time. In addition to their short-time wages they receive additional money from the old company. By law short-time wages should be equivalent to 60 % of previous net earnings. The old company tops this up to 100 % of the workers' original basic income. The new company pays the old one a fixed sum of DEM 575 per worker per month.

4.2. Employment and training companies

Employment and training companies have emerged over the last few years as a new organisational model to which firms and local bodies resort in their attempts to reduce and channel company staffing problems. They provide a catchment solution for employees affected by staff restructuring. A prerequisite in most cases is that the redundancies are brought about by voluntary contract termination rather than dismissal. The employees switch from their old companies to the new ones and are given the chance here for a specific length of time to participate in training aimed at the external labour market and to organise their search for a new job from a working rather than an unemployed status. Various institutions are usually involved in the financing. Resources come mainly from the old company, from the State via labour market policy instruments and from the European Structural Funds. In various cases funding also comes from social plans. These would have to be paid anyway if the alternative of mass redundancy were to eventuate.

The most important function of employment and training companies is to organise and prepare workers for the transition to other jobs on the external labour market with as little disruption as possible. For this reason qualification programmes are a major priority. These are complemented by assistance in setting up a business or becoming self-employed, e.g. by informing workers of vacancies in an appropriate field and providing training in job interview skills (outplacement), and in some cases actual job placement in temporary positions.

5. Conclusions

Should the predicted trend towards a knowledge society actually materialise, the continuing vocational training system as it exists at the moment will be ill-equipped to meet future needs – institutionally, instrumentally and financially (not to mention the many inadequacies in training content itself). The selectivity of continuing vocational training, i.e. the preference given to already privileged or qualified social groups, has increased even further on both the in-company and external labour markets. The continuing training system is not comprehensive enough to cope with the actual and potential demands it faces. There is only limited coordination of in-company and public continuing training activities. The European Regional and Structural Funds currently represent the main source of innovative impulses with their attempts to use continuing vocational training for specific structural policy goals. These point the way to a new policy direction for the modernisation of continuing training in that they hold companies responsible and offer targeted public assistance for programmes aimed at adapting to structural change. The qualifications needed in the knowledge society of the future will have more than just single-company application and because of their quality as public property will have no market price. For this reason modernisation of continuing vocational training cannot succeed without a certain degree of public responsibility (Kutscha, 1997).

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(4) The parties involved were the principal entreprise responsible for coal mining, Ruhrkohle AG, the *Land* Labour Office of North Rhine-Westphalia, the North Rhine-Westphalian Trade Craft League as well as the Ruhrgebiet Initiative, an association of various individuals.

Other discussions pointing in a similar direction concern a universal model for a modern form of continuing training based on the equal opportunity principle with reliable and just structures for accessibility, leave, equality, permeability and financing (Kutscha, loc. cit.).

Related considerations include using reduced basic working time – at least to a certain extent – for continuing vocational training so as to establish a general continuing vocational training entitlement (Seifert, 1997). On the other hand, there is a growing expectation that publicly funded continuing training should serve as a hinge between companies and the external labour market and provide for smooth transitions promoting structural change (Schmid, 1996). A precedent has been set by rotation models introduced successfully in Denmark and more recently in other European countries. Furthermore, the development of qualification networks has been suggested as a means of fulfilling the necessary infrastructural requirements for systematic and comprehensive continuing training programmes (Bosch et al., 1997). These would link various regional continuing training institutions (businesses, training providers, chamber of commerce, etc.) and combine their continuing training resources into common pools.

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IV. Inter-enterprise and in-company developments and local/ regional competition

Chapter IV deals with the main points of **training and further training within companies**, particularly the methods used and the competencies and skills they seek to develop. It contains three articles. The first deals with new trends within major European companies and attempts to classify the specific learning approaches created or designed to develop skill profiles. It describes the further training strategies implemented by companies to cope with the ongoing reorganisation of production and services, and illustrates how they are making better use of the potential skills of their employees and involving them more in the change process relating to work organisation. The second article deals with the competitiveness of small and medium-sized enterprises and their approaches towards providing technology and management training for their workforce. SMEs had to improve their chances of survival, particularly through the further training of managers and the entrepreneurs themselves. In view of the great pressures placed upon the latter, new paths would have to be taken and a system of comprehensive support, information, advice and continuous training set up between companies. The third article deals with similar issues relating to practical approaches and experiences. It shows that by establishing closer links between measures implemented by the public bodies of a sector or region and local companies a strengthening dynamic could be set in action that encouraged job creation, and promoted the competitiveness of the companies and region or sector concerned. Training and further training provided by VET colleges, technical colleges and universities in the region, training schemes set up in cooperation with companies and the adaptability to meet on-the-spot needs would play a crucial role in this process.

***Barry Nyhan*'s** article describes trends in competence development, which was **one of the strategic factors in ensuring companies' survival and competitiveness**. There was still much discussion going on concerning the nature of the competencies required, and how companies could become learning organisations and create an organisational learning climate which would support the development of these competencies, and there was no agreement on the matter. Using case studies, the author puts forward a taxonomy of methods and competencies for the very different teaching and learning situations, discusses the conditions and calls for efforts to be made by companies and industry-wide to improve the interaction between informal (on-the-job) teaching and learning and formal (classroom) teaching and learning. 'Visionary' companies had already started taking steps in this direction and were making great efforts, but many others had got no further than general considerations of the matter.

A number of general principles firstly had to be clarified, which were needed to underpin the ongoing change and adaptation process and its dynamic, namely visionary management and support given by managers of enterprises, their willingness to take risks, trust in the competencies of their workforce and wide understanding of the change process itself, etc. The competence profiles required were emerging along the following four axes – cognitive, technological, social (organisational) and business (entrepreneurial). Efforts had to be made to understand and master the general complexity of the situation behind each profile. This was no longer a management concern alone, but one which demanded the full participation of all the workers and experts in a company.

John Konrad underlines that **the most crucial problem facing small and medium-sized enterprises and new enterprises was how to strengthen their chances of survival**. A large number of new enterprises would not survive the difficult start-up period. Access to effective training that met their short and long-term needs had to be improved. This could increase employment and promote social integration, and also encourage a flexible, decentralised and adaptable economy. The author calls upon researchers to double their efforts to determine the necessary support mechanisms that can be implemented at local and regional level, appeals for the recognition of training qualifications across Europe, and asks for greater commitment on the part of the EU in promoting local structures and actions, particularly in view of the Agenda 2000 programme for the accession of eastern European countries to the EU. New concepts, actions and practices needed to be developed and fostered through greater cooperation in the field of research.

Loek Nieuwenhuis's article concentrates on the **role of vocational education and training in facilitating innovation in small and medium-sized enterprises** in the process of regional and sectoral development. Local industrial networks and their links with VET colleges and training centres in the region were becoming increasingly important for sustaining the dynamic of the training process. Common learning activities and continuous interaction between VET colleges and companies would take the place of traditional initial vocational training and further training, despite the fact that the role of VET colleges in these innovation processes was still rather marginal. To become 'spiders' in regional innovation networks, VET colleges had to develop towards becoming learning and networking organisations themselves. Using a number of concrete examples in the Netherlands, the author clearly shows how such networking and dynamics can make significant contributions to both local and regional economic development and to the renewal of sectors of the economy as a whole.

A. Trends in competence development in European companies

Barry Nyhan (1)

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(1) European Commission, Directorate General XXII – Education, Training and Youth, Project Coordinator at Cedefop since the end of 1998

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Summary and outlook

Competence development is one of the critical strategic factors in ensuring companies' survival and competitiveness. This has given rise to much discussion, firstly, on the nature of the competencies required, and secondly, on how companies can create an organisational learning climate which will support the development of these competencies.

This paper examines the experiences of a number of European companies, which appear on the surface to have similar views on the kinds of competencies required and to be using the same kinds of innovative competence development and learning organisation strategies in fostering these competencies. When analysed more closely, however, it emerges that these firms have different perspectives on the position competence development holds in the hierarchy of company values. Three distinctive strategies emerge – *visionary* (value-based), *organisational/structural change* focused, and *problem-solving* oriented.

The five central features which can be found in the vision-based companies (those which can be said to have implemented learning organisation strategies more fully) and to a lesser extent in the others are as follows:

- dynamic visionary leadership and support by senior management
- willingness to risk putting one's faith in the competence of the workforce
- existence of an overall framework for the change process
- creation of a shared vision based on the implementation of a vertical organisational change programme
- commitment to and development of a practical programme.

The competence profiles emerging were along the following four axes – cognitive, technological, social (organisational), and business (entrepreneurial). An outstanding feature of the overall competence required by workers in the companies portrayed, is the capacity to understand and handle social/organisational and technological complexity. This kind of worker is able to relate the specific tasks which he/she is engaged in, at any moment in time, to the overall task being carried out by other members of the organisation. This person, therefore, needs to have a helicopter view of the organisation and feel in contact with the different parts of the system. These attributes were traditionally seen as ones which only management required.

In general terms most of the companies surveyed tended more towards what can be termed informal learning rather than formal training as a predominant approach. Informal learning refers to the learning effects of how work is organised. Formal training did play an important role, however, in particular to meet individual technological skill development needs.

1. Relationship between technological, organisational and competence development strategies in modern companies

In the course of the last 10 to 15 years, European companies have been subjected to similar challenges as other firms in the industrialised world. More specifically, they have had to deal with two major developments in the global business environment.

The first relates to the saturation in the demand for standardised mass-produced consumer goods. Markets changed from being primarily sellers' markets to buyers' markets with

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a subsequent move away from price competition, towards one based on flexibility, quality and quick delivery – in other words meeting customers' individualised needs.

The second challenge related to the advent of efficient and reasonably priced micro-electronic technologies, which were seen to have the potential to automate many aspects of manufacturing delivery systems (Naschold, 1993).

Company managers, who had been schooled in the Tayloristic tradition of scientific management, felt that the new technologies would give them the opportunity to automate their manufacturing systems in a way that products could be individually produced, with limited human intervention. In this regard, it should be remembered that the technical 'rational–analytical' paradigm had been the dominant one behind the concept of scientific management, according to which there is 'one best way' to organise work. According to this view, managers with the assistance of experts determine what this is, and the 'non-expert' employees follow their instructions exactly. The introduction of information technology in the 1980s reinforced this kind of thinking, leading to the notion of a factory where humans could be replaced by robots as manufacturing and administration operations are centrally controlled by management.

The findings of many European researchers, however, have shown that information technology cannot be implemented effectively without paying attention to the issue of human responsibility, initiative and skill (Docherty, 1991; Rauner and Ruth, 1989; Corbett, Rasmussen and Rauner, 1991). The success of the Japanese work organisation model, Toyotism, which respects the human (synthetic-intuitive) and the technological (analytical-rational) dimensions, made a major impact on the thinking of European companies just as it did in the rest of the industrial world.

1.1. A move away from the rational-technological model of the workplace

Today, therefore, we see many examples of companies which have introduced systems of management and organisation which differ radically from the centrally controlled, top-down models. The one best way or the grand design theory is not seen to have validity, because the action field of the environment is too complex. Unique decisions are called for in relation to the specialised needs of the customer. Studies in the automobile industry, in particular, have shown that it is the nature of the dynamic interactions between technology, social organisation of work and human competence that determines the success of a company.

The move from a mass production market towards a customised market based on quality, price and speed of delivery is forcing companies to disregard centralised autocratic command-type management and control practices, and embrace ones giving employees more discretion about how to undertake their work.

In this regard Handy (1994) makes an interesting historical analysis:

'For a long time now, corporate chairmen have been saying that their real assets were their people, but few really meant it and none went so far as to put those assets on their balance sheet. That may change. Peter Drucker points out that the "means of production", the traditional basis of capitalism, are now literally owned by the workers because those means are in their heads and at their fingertips. What Marx once dreamt of has become a reality, but in a way which he could never have imagined. Focused intelligence, the ability to acquire and apply knowledge and know-how, is the new source of wealth.'

The changes in workers' functions, in line with the above, to be observed in a growing number of companies are as follows:

1.1.1. A move away from the vertical division of labour

This can be portrayed as the transfer of certain traditional management and control functions to workers on the shop-floor, where goods are actually being produced. In line with the principles of, for example, 'lean production', 'the maximum number of tasks and responsibilities (are transferred) to those workers actually adding value to the (product being manufactured)' (Womack et al., 1990). This entails the integration of many traditional direct supervisory tasks (and other indirect tasks, such as production planning and process control) previously undertaken by specialised middle management staff, with those of the shop-floor production workers or teams of workers.

1.1.2. An integration of work functions at the horizontal level

This involves production workers being given responsibility for certain tasks such as quality control and machine maintenance, which traditionally belonged to specialised service staff from separate production-support departments. Workers are also expected in many cases, more particularly in a team-work context, to have a range of skills – to be multi-skilled – so as to be able to work on a variety of machines or to deputise for each other.

1.1.3. Teamwork is emerging as the most common form of organisational structure through which vertical and horizontal integration is being implemented

Teams can be accountable for carrying out all aspects of a job. Each team, or what is sometimes called a production island, can have responsibility for carrying out its operations in a more or less self-managing and self-controlling manner.

The above developments, in line with what some researchers refer to as flexible specialisation are having an influence on manufacturing trends in Europe. Production units (islands) utilising programmable technologies, and comprising skilled workers supported by knowledge-based management, can adapt to rapidly changing markets and deliver specialised and high value-added products (Wobbe, 1992 p. 143).

Overall coordination of the efforts of the different teams/units is established by a variety of means, such as the utilisation of matrix style management approaches, company-wide or inter-team project groups, and often technology-based information and communication systems and networks.

A comparison of the traditional and emerging work patterns with specific references to work organisation issues is presented below:

Old Organisations	**New Organisations**
Standard product	Product variety
Assembly line	Module production
Single-purpose mechanisation	Flexible mechanisation
Unqualified workers	Qualified (skilled) workers
Low work motivation (indifference)	High work motivation (identification)
Conflictual labour relations	Cooperative labour relations
Hierarchical management	Participatory management
Vertical division of labour (separation between planning and implementation)	Vertical job integration(enrichment)
External control, Internal self-regulation	
Horizontal division of labour (extreme breakdown of tasks)	Horizontal job integration (enlargement)
Workers tied to workplace	Rotation
Machine paced	Independent from assembly line
Time standard	Time sovereignty
Individual work	Group work

Source: Jürgens et al. 1989. p. 4 (see Naschold, F. in: Thurman J. et al. 1993. p. 212 adapted by the author)

1.2. New roles and competencies for line workers

The decentralised company which operates on the basis of delegating responsibility to teams and individuals at the operational (front-line) level has to think differently about the role and competencies of its workforce. These workers become central actors in the company, carrying out planning, execution and control functions.

In this regard they require core-competencies such as the ability to take initiatives, engage in abstract thinking, work in a team, ability to learn (self-learning competency) and so on. The people who possess these core-competencies have the ability to cope with changing business and technological climates. They can manage themselves in relation to economic and social change – they can learn to utilise new technologies as they come on stream.

The kind of knowledge required by people working in computer integrated manufacturing systems (CIM) according to Ebel (1989) is described as follows: 'CIM requires... people who understand production methods and the system and are capable of handling a great deal of technical information, and of taking decisions on the spot, interpreting faults rapidly and correcting them. Judgement backed up by technical knowledge and experience, understanding of the system and common sense is a human quality that cannot be replaced by computers or artificial intelligence in the foreseeable future. In CIM systems, machines and computers may well take over most routine and physical tasks, but they do not relieve the people involved from thinking, critical decision-making and responsibility.' (Ebel, p. 543).

This kind of knowledge can be defined as understanding what you are doing in dealing effectively with situations in a living system, which has interdependent, business social and technological elements.

It can be called holistic or integrated knowledge because it contains both formal/theoretical and practical knowledge.

Formal knowledge
- theoretical knowledge
- understanding of general principles
- understanding of technological principles and processes
- objective analysis
- logical thinking
- abstract thinking

Practical knowledge
- making a judgement about the situation in hand
- dealing with the situation
- knowing how to take up one's role
- understanding the social context
- making technical decisions
- knowing in doing
- institutional knowledge
- knowledge based on experience

The above division of knowledge is similar to the one outlined by Goranzon and Josefson (1988). According to them, professional knowledge is divided into the three categories of propositional knowledge (similar to formal knowledge), practical knowledge and knowledge of familiarity. The latter is the knowledge gained from examining the experience of others.

In the above classification, the knowledge of familiarity is included under the heading of practical knowledge on the basis that practical knowledge comes about through reflecting on the experience of others as well as on one's own experiences. (The Irish dramatist, George Bernard Shaw said that: 'The fool is someone who learns through his own mistakes, while the wise man learns through the mistakes of others'.)

1.2.1. Personal effectiveness

Another term used to describe the profile of the modern worker is personal effectiveness. People who are personally effective in their working lives have the ability to organise themselves to respond to any task they are called upon to do. They bring all their skills and resources together and apply them to meet a specific situation. Personal effectiveness refers to attitude – the internal driving force in a person.

Two main characteristics, a sense of initiative and a sense of responsibility, mark an action by someone who is personally effective.

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'Initiative' refers to a person being enterprising or a 'self-starter'. Pure initiative on its own, however, is not enough. It has to be balanced by 'responsibility'. This means a person is not just 'doing his/her own thing', but is making the right choice implementing appropriate actions and taking other people into account. '"Initiative" causes a person to act as an individual while "responsibility" relates him/her to others, to the group and the organisation.' (AnCO, 1984). Drucker (1992) foresees a swing towards regarding 'responsibility' and not 'power' as the most important variable within modern organisations.

1.2.2. Managing oneself in role

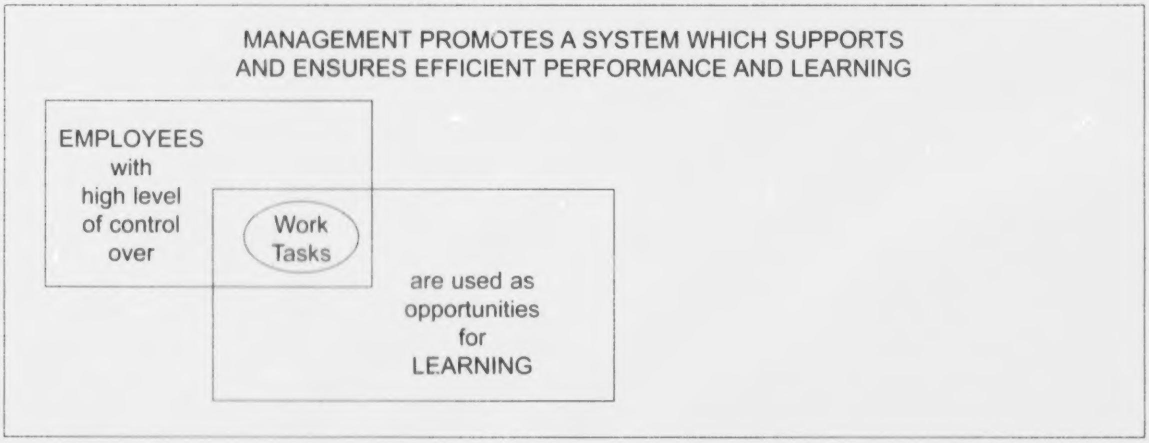
The concept of managing yourself in role, developed by Reed (1985), is useful in understanding the situation faced by modern workers. Reed points out that social scientists normally use the term *role* as a way of describing a person's expected behaviour. He refers to this as one's *sociological* role – the role assigned to someone by means of a job description, job title, etc. This is the *objective* dimension of role. The counterpart to this – the *subjective* aspect of role – *how I behave in practice*, is determined by a person's own judgement in a particular situation. This is one's *psychological role*, which has to be managed by means of an individual's internal control system. As circumstances are constantly changing, a role in this sense is never static. An analogy can be drawn with a yachtsman, who is order to follow a definite course, has to adjust constantly the steering to take advantage of the prevailing winds.

1.3. Competence development becomes a strategic issue for management – the learning organisation

As modern companies see higher levels of worker competence as a key to flexibility and competitive advantage, competence development becomes a strategic issue for management. Quinn (1991) and Prahalad (1990), who have developed the idea of competence/capability-based strategy, maintain that a company's strategy should be based on competencies that are difficult for competitors to emulate. Prahalad (1993) uses the term core competencies in a different sense from the way it was used earlier, to mean the collective learning of an organisation, especially regarding the ability to coordinate and integrate different skills and technologies.

Companies attempting to implement this competence-based strategy can be said to be aspiring to take on the features of what other authors refer to as a learning organisation.

There are many definitions of a learning organisation. Some stress the notion of an organisation as a cybernetic entity (a corporate body) which learns from its experiences through encoding the insights gained, into company routines. Other authors in the field,


MANAGEMENT PROMOTES A SYSTEM WHICH SUPPORTS AND ENSURES EFFICIENT PERFORMANCE AND LEARNING
EMPLOYEES with high level of control over
Work Tasks
are used as opportunities for LEARNING

pointing out the failures of many learning organisation notions to bridge the gap between theory and practice, prefer to focus on developing individual learning abilities in relation to specific company goals and change processes and so in turn having impact on the organisation as a whole (See discussion in Garvin, 1993 and Jones and Hendry, 1992).

The main focus in the learning organisation model presented by Stahl, Nyhan, and D'Aloja, (1993) is on all employees in a company learning in a systemic or global organisational context. Organisational effectiveness and individual learning are seen as interdependent factors. Organisational effectiveness provides an impetus for individual learning, while the latter in turn contributes to an increase in organisational effectiveness.

A learning organisation according to this model can be described as:

A company which involves all its members in increasing organisational and individual effectiveness, through continuously reflecting on how strategic and everyday tasks are handled.

The word 'reflection' in this description refers to thinking about and implementing new actions so as the company's strategic operating processes and products can be improved.

If this model is implemented in an idealised situation, line workers are learning as a result of being assigned challenging tasks and through being assisted to reflect continuously on those tasks, so as to learn from them. The work content therefore becomes the learning content, as work and learning become part of a constant improvement spiral having an impact on the competence level of individual workers, the collective learning of work groups and the total organisation.

The key pieces of evidence, which show that a company relates to the above framework, are:

a) The line production employees have a high level of autonomy and control over the execution of their work tasks;

b) They are supported to use these work tasks as opportunities for continuous learning and competence development.

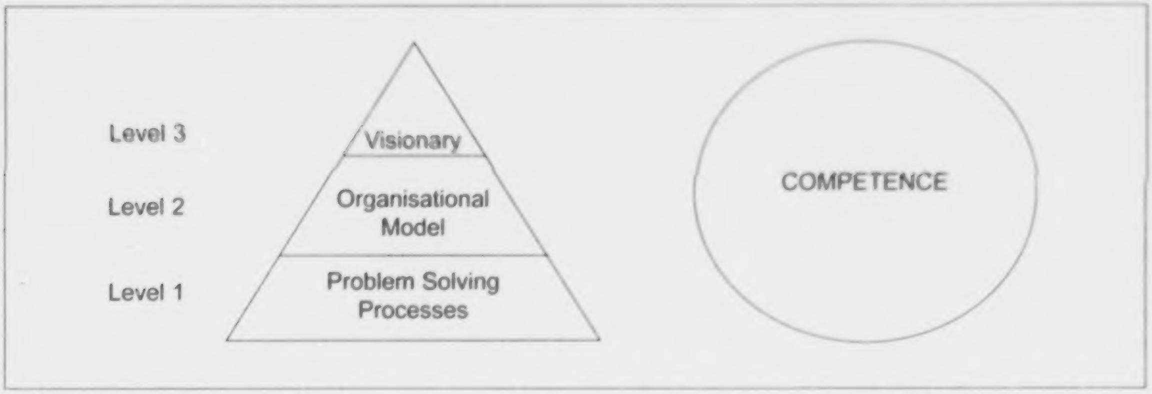
The manner in which work is organised ensures that all individuals are learning about their own role and responsibilities and how these relate to other roles within the overall system.

The real changes taking place at a grass roots level are a sign that a total organisational change has taken place. A management philosophy integrating working and learning has permeated the whole organisation. A management vision has become a vision in action. Many of the companies fulfilling the above criteria in adopting radical competence development strategies have not set out with the goal to become learning organisations. They may not even have heard the term. They had become learning organisations, however, even though they did not call themselves by that name.

In stressing that the evidence for a learning organisation vision being truly embedded in a company lies in the changed behaviour of all employees, one must relate this to the critical role of management. In fact management is the instigator of the whole change process. Without the understanding, leadership and continuous support of top management, any attempts to introduce wider roles for employees and linked work-based learning are doomed to failure.

Any lasting changes relating to the parts of an organisation have to be placed in the context of the whole system. The manager's main responsibility is to ensure that the organisation as a whole is operating effectively internally and that it is interacting effectively with the outside environment in relation to customer needs and monitoring positive and negative influencing factors.

This means that the manager has to be a systems thinker promoting an understanding of the company in terms of causal interrelationships rather than linear cause-effect chains, and in terms of complex processes rather than static functions (See Senge, 1990).



2. Putting theory to the test – experiences of European companies

What would companies implementing radical competence development strategies, (along learning organisation lines, for example), or taking steps towards implementing them, look like? How would they conceptualise and formulate these strategies? What development steps would they go through? What would be the nature of the competencies cultivated in the workforce? What kinds of learning approaches would these organisations use?

A research project (2) set out to answer the above questions in relation to European manufacturing and process companies. Utilising European research and training networks a number of firms illustrating innovative competence development/human resource development policies, were identified.

Authors from different backgrounds – researches, company managers, training and development consultants – provided case studies, analysing companies' experiences against a common framework. Three seminars took place during which the cases were analysed and discussed. Of the 11 case studies presented, five represented large and medium-scale batch production mechanical and manufacturing industries and six were concerned with light and heavy process industries.

Cases from seven European countries were provided – Belgium, France (3), Germany (2), Ireland, the Netherlands, Sweden (2) and the United Kingdom.

The cases related experiences from the following companies:

1. Clark Hurth – the Belgian subsidiary of an American company, which manufactures heavy transmission units;
2. Aluminium Dunkerque – a new French aluminium plant which is part of the Pechiney group;
3. Autoplastique – a pseudonym for a French company manufacturing plastic components for the automobile industry;
4. Manducher – a progressive French plastics company supplying the automobile industry;
5. Audi/VW – the well-known German car manufacturing company;
6. Felten & Guilleaume – a German electrical engineering company, located in Bremen;
7. Bord na Mona – a semi-State peat production company in Ireland;
8. Sara Lee – a Dutch subsidiary of an American consumer products company;

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(2) For the results of this project see – Docherty, P., and Nyhan, B., (Editors), *Human competence and business development-Emerging patterns in European companies*, London, Springer Verlag, 1997. The remainder of this paper is based on the findings related in that book and on a paper entitled – 'Learning and the Workplace: Perspectives on Competence Development in European Companies', delivered by the author at a conference entitled: 'Global Competencies – Workplace Outcomes' at Darling Harbour Convention Centre, Sydney, Australia, 1995.

9. B&T (Byggtransportekonomi) – a Swedish mechanical engineering company;
10. Volvo Auto (Uddevala) – a Swedish car manufacturing plant which has been the subject of much discussion;
11. Cadbury – a British chocolate factory.

2.1. Common framework of analysis

The 11 companies were analysed in relation to a common framework which depicted different levels of progression in the adoption of competence-based strategies.

Level 1 – problem solving perspective

This represents a view of competence development as a means to introducing new problem solving processes in a company to meet its current needs. This could involve the introduction of new tools, equipment or operating systems. A radical evaluation and overhaul of current management and organisational strategies and models does not take place. The impact of competence development is mainly confined to the worker/shop-floor level.

Level 2 – organisational model perspective

This relates to the adoption of radical organisational models or management strategies such as TQM, world-class manufacturing systems which demand competence development on an organisational level, involving all managers and employees. The central feature of the change taking place is the adoption of an external organisational model.

Level 3 – visionary perspective

This entails a radical shift in the company's values concerning the roles and responsibilities of all employees in the achievement of the company's business goals. The implementation of the new company vision is based on the competence of the workforce. The chief executive of the company plays the key role in articulating and gaining company-wide acceptance of the new vision.

2.2. Where the 11 companies fitted in

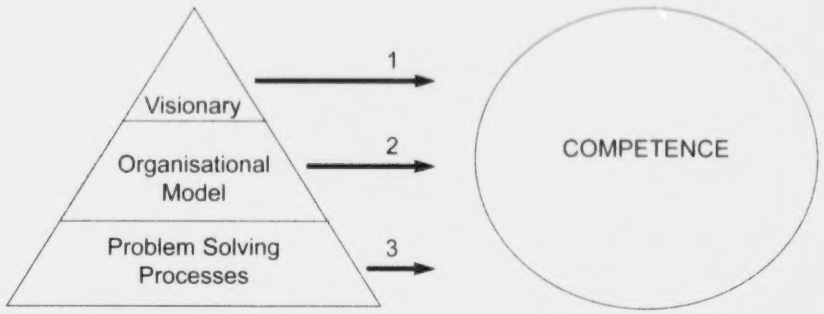
Level 1

Three cases of the 11, Autoplastique, B&T and Clark Hurth, provide us with examples of companies which have incorporated innovations in their existing structures to respond to problems they are experiencing, without undergoing a radical structural or management transformation.

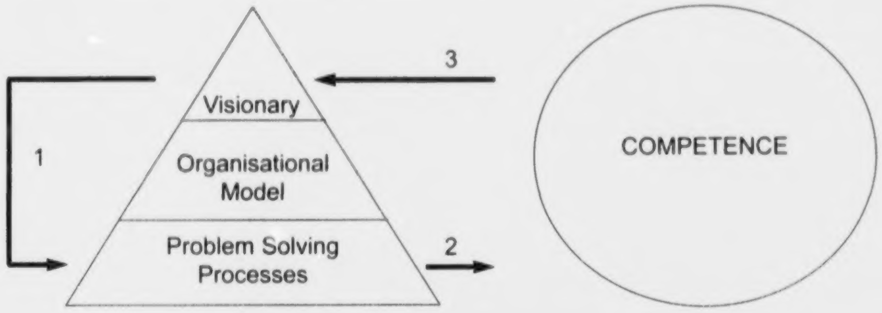
These companies adopted a contained competence development approach within more or less traditional management control frameworks.

Level 2

Three more cases, Audi-Volkswagen, Cadbury and Felten & Guilleaume illustrate the suc-



Aluminium Dunkerque, Manducher and Volvo



Sara Lee

cessful importation of a state-of-the-art management or organisational model, entailing a company transformation with a major emphasis on competence development.

The change, which took place, was based on the successful adoption of an external model as distinct from being driven by an internal company-inspired innovation. For that reason therefore they are classified as secondary movers, their change process being based on the implementation of existing best practice management and learning systems and structures. The change in these companies is, therefore, fundamentally at a structural level.

Level 3

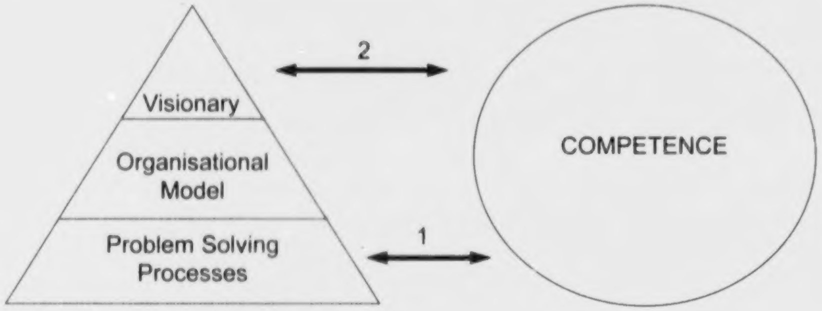
Five companies can be said to have adopted radical business policies based on a maximum development of the competencies of their front-line workers. These companies have adopted business strategies which enshrined competence development as a key value.

The change process in these companies started as a result of an internally generated company vision, giving rise to the adoption and application of competence-based values. These companies which can be termed prime movers in the change process are: Aluminium Dunkerque, Bord na Mona, Manducher, Sara Lee and Volvo.

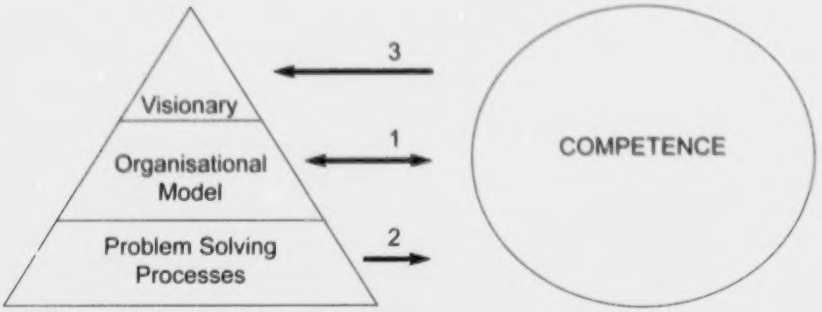
2.3. The nature of the changes and the shape of the development processes

2.3.1. Visionary companies

The three companies Aluminium Dunkerque, Manducher and Volvo can be grouped together on the basis that the process started with a



Bord na Mona



Audi/VW, Felten & Guilleaume and Cadbury

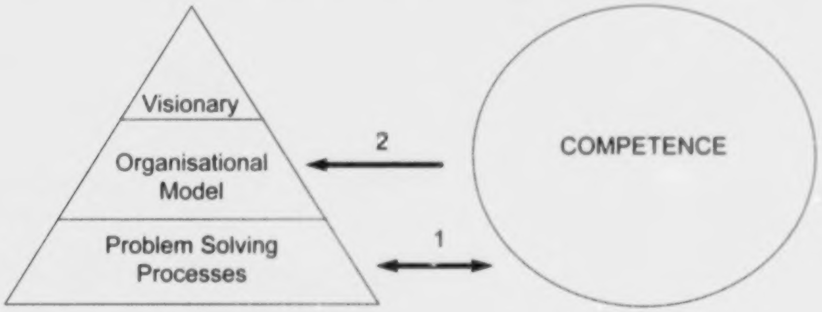
new vision regarding the critical role to be played by line production workers in the achievement of business goals. This was step 1 – see diagram below. Steps 2 and 3 proceeded on from this. The competence of the workforce was seen as the key to getting things done. This entailed a reliance on human innovativeness.

Manducher for example changed on the basis of feedback from the workers who felt that they were not being given discretionary powers.

Volvo started with a vision of a factory in which workers' creative craftsmanship skills (planning, controlling, sense of ownership of the product) were mobilised to make a maximum contribution in a modern technological-based production setting.

Aluminium Dunkerque started with the premise that unemployed people, in an economically depressed area, can be retrained to play a central role in ensuring efficiency in a process plant.

Sara Lee differs from the above three companies in that its initial focus was on the competencies of the business units (step 1) which would enable the company to innovate, to try new ways of doing things, thus ensuring continuous innovation. This was their fundamental value which was adopted as part of a value clarification exercise. A company-wide training programme was implemented (step 2) which had the business units at the centre, but was located in a total organisation context (looking up and outwards at the external business environment of the company) and linked to individual roles in the business unit in the form of per-



Autoplastique, B&T, and Clark Hurth

formance goals. This reinforced the vision (step 3).

Bord na Mona arrived at a similar value position as Sara Lee, but not on the basis of a proactive value clarification process. A company crisis forced them to take radical steps. They experimented with teams as autonomous business units (step 1) and discovered that they worked. They then ratified this system, putting the weight of the company behind it. This meant that a new value system was declared and implemented formally (step 2), but more importantly, became embedded in the shared informal value system of the company, which included management, workers and their trade union representatives.

2.3.2. Companies taking on new organisational models

The three companies, Audi/VW, Felten & Guilleaume and Cadbury can be termed secondary movers. The changes in Audi/VW and Felten & Guilleaume can be seen in the context of the new national policy guidelines emerging in Germany related to a national research and development programme. This work gave rise to new organisation models based on 'production island' manufacturing principles and new instruments for work-based learning with competence development seen as a central strategy (steps 1 and 2).

Audi/VW and Felten & Guilleaume, therefore, can be seen as an illustration of this new policy, which is sustained by a broad continuity with traditional German values regarding the central role of skilled workers in manufacturing companies. The beginning of a shift towards new values could be said to have taken place (step 3).

Cadbury illustrates the application of TQM principles which gave rise to the need for substantial competence development.

2.3.3. Problem solving oriented companies

The three companies Autoplastique, B&T and Clark Hurth illustrate how competence-based strategies were only partially implemented. Although radical changes were introduced at the work process and worker competence levels (step 1) the impact made on management structures and values was limited (step 2).

In the case of Autoplastique, even though the adoption of new management tools gave rise to dynamic learning patterns, management seemed incapable of changing its self-image as a centralised, rather autocratic controlling agency. They saw the changes as having to do with the implementation of new techniques without any corresponding significant changes in values.

The Clark Hurth case illustrated an extended change and learning process. The case depicts a rather tortuous piecemeal change process in which management gradually allowed more autonomy to be given to workers, with significant repercussions for their competence development. The overriding cautiousness of management, however, did not allow radical value changes to take place.

2.4. Features of competence-based strategies in the companies

This section is devoted to an analysis and discussion of the key features emerging in the companies which allows one to characterise them as competence-based companies.

The five central features which can be found in the vision-based companies and to a lesser extent in the others are as follows:

1. dynamic visionary leadership and support by senior management;
2. willingness to risk putting one's faith in the competence of the workforce;
3. existence of an overall framework for the change process;
4. creation of a shared vision based on the implementation of a vertical organisational change programme;
5. commitment to and development of a practical programme.

These five characteristics, which illustrate different aspects of competence-based values, can be seen as the pillars on which a company builds a competent workforce.

2.4.1. Dynamic visionary leadership and support by senior management

This first point reflects the degree to which the chief executive of the company has taken competence-based values on board and is prepared to embark on an organisational change process to transform the company in line with these values.

All of the five companies classified as prime movers – driven by competence-based values – had inspiring senior management who adopted a new mindset concerning the degrees of freedom and control to be exercised by employees. By the same token, the senior management of those companies who remained at the problem-centred solution level, such as Autoplastique, seemed reluctant or afraid to initiate a policy based on removing traditional management control systems.

The key driver in the change process is in the first place, the chief executive of the company. The head of the human resource development department can initiate real change only on condition that he/she receives total backing from the chief executive. The significant part played by the chairman and directors in initiating change is clearly illustrated in the case of Aluminium Dunkerque, in which the new plant was deliberately designed from the start to give prominent roles to front-line production workers.

Manducher illustrates how close cooperation and trust between the chief executive and the newly recruited personnel manager facilitated an effective change process. The senior management of Sara Lee reinforced their new company orientation through ensuring that an environment was fostered in which middle management (business units managers) felt fully involved in the company decision-making process. Thus they appeared to have avoided some of the problems which the middle management in Aluminium Dunkerque and Felten & Guilleaume had with their new roles *vis-à-vis* the line workers.

In the case of Sara Lee the corporate strategy focused on the concept of entrepreneurial management encouraging managers to feel and act like owners of the business unit for which they were responsible. A visionary image was utilised to communicate the new management philosophy and to inspire employees to adopt new ways of working. Similarly the new production process in Volvo was driven by a new vision, articulated by the company chairman, of the autoworker as someone who can built a complete car on his/her own. At the same time one can conclude that it was the failure of a significant group of senior management to take on board this new vision which caused the project to be terminated. The failure to achieve a consensus among senior management and the emergence of a more dominant divergent management school, eventually led to the demise of the chairman's radical vision of 'the new worker'.

The Autoplastique case illustrates a solution which many managers may be tempted to adopt – introducing new production and learning techniques within a traditional management framework – putting new wine into old bottles. The result in Autoplastique was an uneasy coexistence of prescriptive management strategies alongside open learning practices, not an ideal framework for sustainable development.

2.4.2. Willingness to risk putting one's faith in the competence of the workforce

The willingness to risk depending on the competence of employees, as the key to ensure the future of the company, is a common feature which can also be found in the companies effecting real change.

'Risk taking was a central feature of the new Bord na Mona, with a creative tension between the old control and the new autonomy of the teams'. It was the chief executive who took this risk in the interest of the survival of the company, a decision comprising elements of both inspired and pragmatic leadership. This meant 'a total culture change for the company which involved setting up consensus within the group, carving out their own identity and direction and transferring leadership to teams'. Team-based activities were not new to the company – 'what was new, was the focus on, and centrality of teamwork. Even though this risk-taking resulted in a fragile consensus with the impact of the new values still reverberating within the company, the strong feeling of the workers after six years, was that there is no going back. The fragile consensus in Bord na Mona can be contrasted with the uneasy trade-off type of agreement in Autoplastique and the volatility of the consensus achieved in Volvo eventually resulting in a breakdown.

Felten & Guilleaume made a dramatic change from a reliance on a technology centred investment policy to a human resource one based on the unknown production island principle. This meant risking to place one's confidence in people rather than in technology.

The low risk threshold of B&T (the fear of losing control), on the other hand, prevented them from learning from the insights gained concerning the human-technology interface in the temporary group established to set up the new technology system. One can also point out the fear of the unknown as one of the factors inhibiting Clark Hurth from embarking on a radical competence-based policy.

2.4.3. Existence of an overall framework (building on traditions and utilising new research)

The change process in most companies took up to three to four years from the start-up phase to the achievement of a significant objective. There are no examples of overnight re-engineering. The motto summing up the development process therefore is evolution not revolution.

In this long-term context a soundly based framework is required to keep the project on the right tracks. This was provided through broad conceptual organisational change models developed internally or mediated to the company by means of external consultant agencies or through participating in national development programmes. In this respect the two German cases Felten & Guilleaume and Audi/VW benefited from their participation in the national *Arbeit und Technik-Programm* which set out to research and develop new qualification models to respond to the introduction of new technology and new forms of work organisation.

Aluminium Dunkerque relied on sociotechnical design thinking and drew on the theoretical work on *l'organisation qualificante* (learning organisation) developed by French researchers such as Phillipe Zarifian (1993). The Cadbury company adopted a *TQM framework within* which the overall competence development programme took place. Manducher recruited an organisational development expert to design and orchestrate a total company change.

2.4.4. Creation of a shared vision based on the implementation of a vertical organisational change programme

The success of the change process in Bord na Mona can be attributed to the development of informal understanding and mutual respect between employees and management. This issue is at the heart of the notion of implementing a vertical organisational change – everybody in the company is involved in a significant way.

Shared visions

The notion of creating shared visions is important in this regard. Sara Lee focused initially on developing shared visions and values on a company-wide basis and within each business unit. This created a basis for setting performance standards for individual jobholders who then saw themselves as partners in business. The implementation of effective company-wide communication meetings was critical in this regard.

The extensive discussions, which took place between the trade unions and management in Bord na Mona, allowed the company to formulate a shared vision, which gave rise to the motto 'Teams – partnership for progress'. The deep level of trust and understanding developed in the company meant that this phrase symbolised the common ground established and was not just a mere slogan.

Pilot projects

Another method used to ensure the commitment of everybody in the firm was the utilisation of pilot experimental projects in the start-up phase. Felten & Guilleaume and Bord na Mona pilot-tested their overall programme in one department or with a number of employees within their companies. It was on the basis of an evaluation of the results of the experimental project by a group representing social partners and different organisational-development and technical specialists that the next phase was designed and implemented.

In Sara Lee every stage of the development programme was reviewed by all of the key players involved – management, supervisors and workers – so that the next phase was embarked on only after everyone expressed satisfaction with the previous one.

Cross-functional teams

Another means to promote vertical company-wide change, which can be observed in the case studies, is the establishment of cross-functional teams. The purpose of these teams, which were composed of personnel from different departments, representing different seniority levels, was to facilitate vertical and horizontal communication within the company. In Cadburys, for example, these teams which were called 'quality action teams' and were made up of people from different occupational grades, met regularly to ensure that all of the interested parties were au fait with current production and maintenance problems.

Clark Hurth set up ad hoc project groups along the same lines, but comprising training and production personnel, with the aim of devising relevant work-based competence development systems. In the case of Aluminium Dunkerque, planning and development responsibilities such as human resources development were handled by senior managers on a cross-departmental basis, while line management functions in the different departments were handled by less senior staff. This is the reverse of the position in most traditional companies.

Pragmatic cooperation

In Cadbury's and Bord na Mona the notion of pragmatic cooperation acted as a guiding principle for management and trade unions. A collaborative style of industrial relations was to the mutual interest of all concerned. For Bord na Mona, in the final analysis, this meant that workers could determine their own pay levels in line with a gain-sharing principle.

Cadbury realised that higher levels of competence meant higher quality and more flexibility, so employees were rewarded for learning. This also entailed the introduction of new pay structures at operator level to promote the acquisition of new skills. Manducher introduced a rather innovative scheme whereby workers were paid on the basis of the skills they learnt, while managers were rewarded on the basis of their capacity to utilise workers' existing and new competencies.

2.4.5. Commitment to, and development of, a practical programme

The attainment of long-term ambitious goals is dependent on paying attention to the many detailed steps which have to taken. This entails a commitment to planning, to follow-through, implementing and reviewing each of the stages and allocating sufficient financial and human resources to the overall project.

The human resource development department in Sara Lee received a strong mandate from senior management and was therefore allocated sufficient resources to design and implement a radical programme. Similarly in Manducher a personnel director was appointed to draw up and supervise the implementation of a long-term programme. Felten & Guilleaume and Audi/VW anchored their internal programme to a wider national programme which provided them with practical instruments and tools.

The manner in which companies implemented their learning programmes in practice will be covered in more detail later on.

2.4.6. Other factors having an impact on the implementation of competence-based strategies

External support
As already mentioned, the national development programme in Germany had a very in-

fluential bearing on the progress of the Felten & Guilleaume and Audi/VW companies. It gave direction to the process and provided an essential research and consultancy service which allowed experimentation to take place. In France, Aluminium Dunkerque received backing from the French Ministry of Labour. This consisted of conceptual and financial support. Regional labour market and educational agencies also actively collaborated with the company, particularly at the initial stages. Manducher and Autoplastique also benefited to a certain extent from government inspired research and development initiatives.

The wider social context

From a social inclusion perspective Aluminium Dunkerque illustrates how unemployed people, in a region going through industrial decline, can be retrained and successfully integrated in a modern work environment, demanding advanced social and technical skills. Bord na Mona demonstrates how workers from a rural background who had become accustomed to Tayloristic work practices, including adversarial industrial relations, were able to cooperate actively with the company management in implementing radical changes. The management and workers in Cadbury also successfully negotiated a transition from a negative industrial relations culture to one built on pragmatic cooperation.

While Felten & Guilleaume showed how existing older workers could be retrained so as to adapt to modern practices, the picture of the flexible company emerging from Clark Hurth and Autoplastique is one in which younger workers/learners are displacing the older ones. In Clark Hurth, for example, the average age of the workers is 27 years.

Special issues

Bord na Mona was the only company in which change was clearly driven by an enormous crisis. Although Felten & Guilleaume, Manducher, Cadbury, Autoplastique and Clark Hurth were experiencing serious problems, they had not reached crisis proportions when they decided to take counter measures. All of the companies were on brown-field sites with the exception of Autoplastique.

3. New competence demands in European companies

An outstanding feature of the overall competence required by workers in the companies portrayed, is the capacity to understand and handle social/organisational and technological complexity. This kind of worker is able to relate the specific tasks which he/she is engaged in, at any moment in time, to the overall task being carried out by other members of the organisation. This person therefore needs to have a helicopter view of the organisation and feel in contact with the different parts of the system. These attributes were traditionally seen as ones which only management required.

This section firstly discusses some general frameworks, related to the above point, within which worker competence is portrayed by the companies, before going on to describe and analyse configurations of specific competencies and skills to be found in the different companies.

Three related frameworks within which one can describe the new competence and responsibilities of the workforce are as follows:

- capacity to relate to the total picture
- vertical role enhancement
- horizontal role enlargement: multi-skilling.

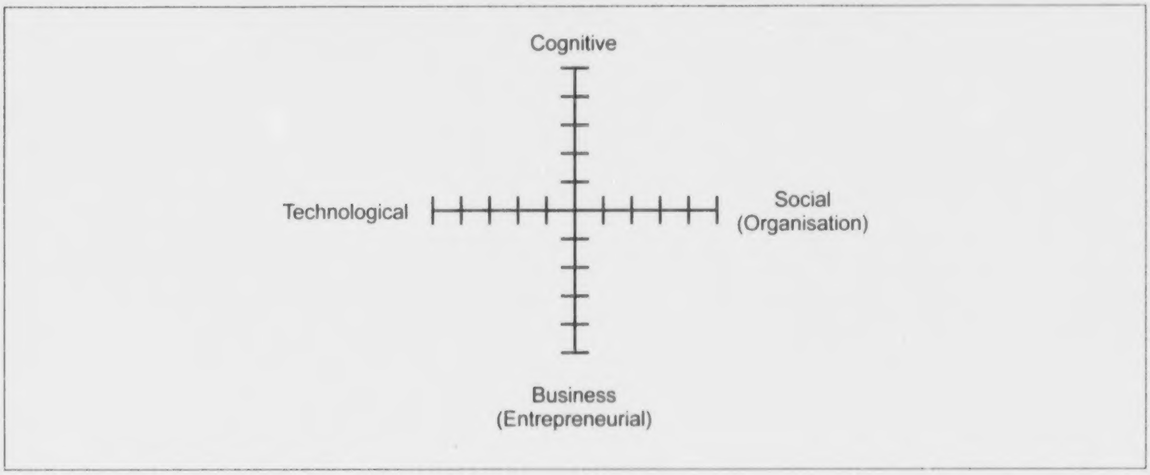
The latter two points, vertical role enhancement and horizontal role enhancement can in fact be seen as illustrations of the first point – the capacity to relate to the total picture.

3.1. Capacity to relate to the total picture

This refers to the capacity to carry out a complete job or long cycle work projects in a relatively autonomous manner, relating one's role to the overall task to be performed by the group/organisation.

This holistic notion of competence was emphasised particularly in Volvo, Aluminium Dunkerque, Audi/VW, Felten & Guilleaume and from a unique perspective in Autoplastique. In Volvo one can note the emphasis which is placed on 'being able to deal with the total assembly system – relating sub-systems to the

Worker Profile – an integration of different competencies



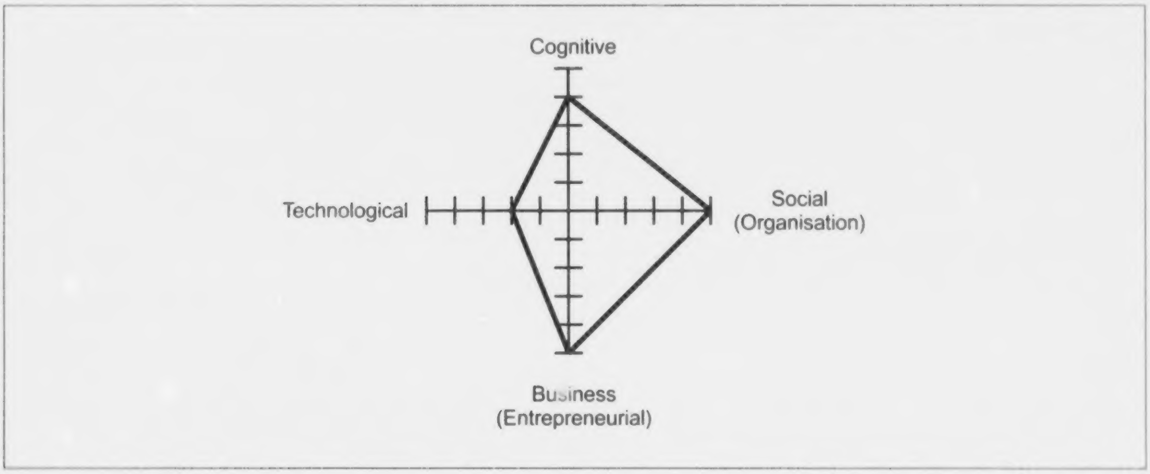
total system'. Long-cycle assembly work demands this type of competence.

In Aluminium Dunkerque, worker development was conceived in terms of progressively moving along different levels of complexity within 'a field of related jobs', instead of learning compartmentalised jobs related to discrete functions. One begins by carrying out normal operations regarding different stages of the work process from start to finish, while gradually improving the depth of one's theoretical and practical knowledge, so learning to handle variance and thereby attaining complete mastery.

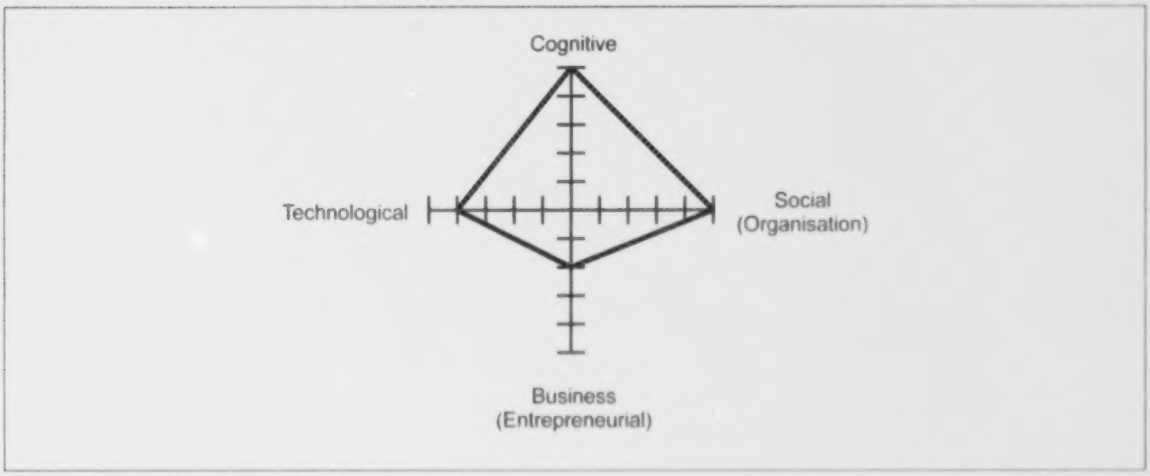
The notion of *Handlungskompetenz* (action-competence) which is a key attribute of workers in Audi/VW and Felten & Guilleaume, refers to the ability to conceptualise, plan and execute all aspects of a complex job in an independent manner.

The Autoplastique case-study highlights the need for employees to possess core competencies in order to contribute to, and participate in the collective intelligence of the organisation. Collective intelligence refers to the formal and tacit knowledge and expertise of the organisation as a whole. It is different from, and greater than, the sum total of indi-

Bord na Mona and Sara Lee



Audi/VW and Felten & Guilleaume



viduals' knowledge, and has a quality of dynamic interconnectedness, which enables people to learn from each other about the whole system.

3.2. Vertical role enhancement

This entails workers taking on certain aspects of what were traditionally considered as management or supervisory functions. In the Bord na Mona autonomous teams, for example, everyone has certain team leadership responsibilities. In Audi/VW, the team, which is also expected to be self-directing, has a spokesman but not a supervisor. Operators also take on new roles in which they become like skilled workers. In Cadburys craft workers have responsibilities for tasks normally considered the preserve of technicians while operators have been trained to carry out certain craft-level functions. B&T showed how in the installation and running-in of new technologies, skilled workers had to assume (borrow) authority from management. When the new equipment was running smoothly, however, the company reverted back to the old boundaries between those having administration and management functions and those with operational functions.

3.3. Horizontal role enhancement: multi-skilling

Multi-skilling is very much in evidence in Cadburys where cross-trade flexibility exists for electrical and mechanical craft workers. Team workers at the operator level are also expected to be multi-skilled, able to carry out all of the functions of the team. The work processes in Aluminium Dunkerque were also based on the principles of multi-skilled teams.

3.4. Profiles of worker competencies

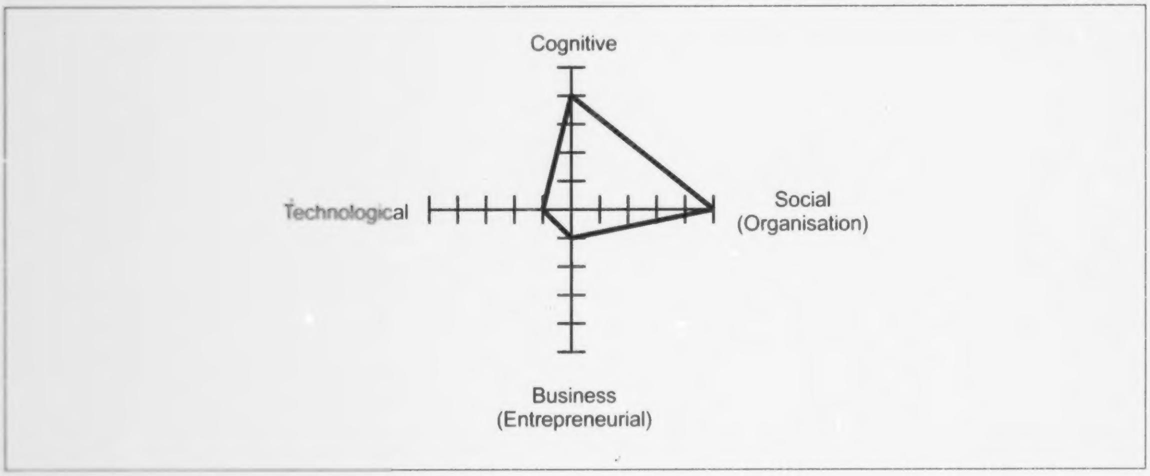
In line with the integrative frameworks within which workers' roles and responsibilities have just been formulated, the profiles of specific competencies can best be understood along four interconnected axes. Overall competence therefore is an amalgam of four different kinds of competencies present to varying degrees.

3.4.1. Business and social-cognitive competencies

Bord na Mona and Sara Lee laid special emphasis on business and social competencies. For Bord na Mona this meant in particular financial management skills as an 'understanding of basic finance was seen as central for the success of the team'. Broad business management skills, such as cost management, forecasting, planning and in particular risk taking, were also seen as essential.

In Sara Lee the emphasis was on employees developing an entrepreneurial spirit – a feeling of being a partner in the business – which is

Autoplastique



manifested through qualities such as initiative and responsibility.

3.4.2. Cognitive-social-technological competencies: key qualifications

The concept of key qualifications was central to the notion of worker competence in the two German companies Audi/VW and Felten & Guilleaume.

Key qualifications are broken down under the following three headings:

- Cognitive skills include, among others:
- observing
- listening
- reading and interpreting drawings and numeric data
- knowledge of how PLC programmes are structured

- Communication and cooperation skills include, among others:
- mutual information exchange
- supporting maintenance actions
- joint problem solving

- Technical skills include skills in the following areas:
- electrical and electronic
- hydraulic
- pneumatic

Key qualifications have to be understood in relation to the notion of *Handlungskompetenz* (action-competence) which means bringing all these qualifications together in an integrated way to carry out a whole job. Aluminium Dunkerque, Manducher, Cadbury, B&T, Volvo and Clark Hurth also illustrate competence profiles highlighting cognitive-

STAGES IN COMPETENCE DEVELOPMENT	COMPANIES
1. Preliminary training	Aluminium Dunkerque Manducher Bord na Mona
2. Pilot development programmes	Bord na Mona Felten & Guilleaume Sara Lee Volvo
3. Workplace learning	All companies

social-technological competencies, similar to key qualifications. The Manducher grid, which mapped the optimum worker competence profile, included – product, process, quality, planning, communication and social skills.

3.4.3. Social-cognitive competencies

In Autoplastique workers developed core competencies for collective intelligence.

The two types of core competencies needed to share and contribute to collective intelligence were of a social and cognitive nature:

- social competencies to share knowledge and know-how including tacit and formalised knowledge – communication and cooperation skills;
- cognitive competencies to create new know-how – ability to anticipate and react, e.g. formulating a problem, taking a decision.

3.5. Learning processes to develop new competencies

The implementation of a practical learning programme was identified earlier as one of the pillars of a competence-based company. This section spells out in detail what this means for the companies surveyed.

Firstly, the sequence of the competence development stages which the companies went through is discussed. This is followed by an analysis of the learning and development processes utilised, and finally the position adopted in relation to learning incentives is examined.

3.5.1. Competence development stages

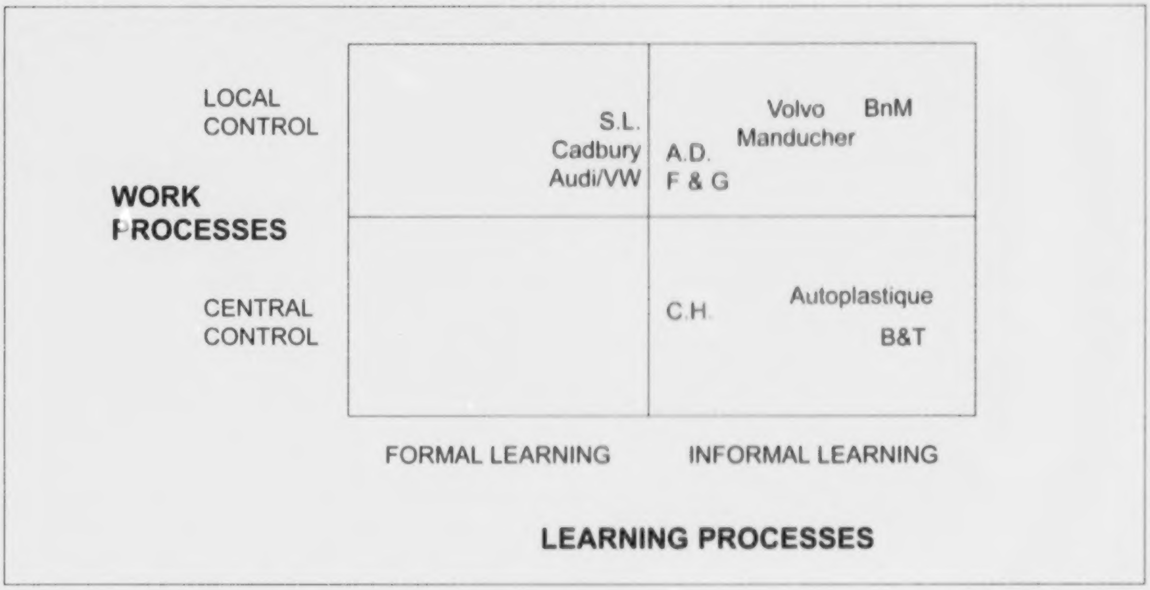
The companies varied considerably in the ways in which they envisaged the steps in an overall development process. Six of the companies decided to implement extensive preliminary training or pilot development programmes. The purpose of a preliminary training programme was to bring people up to a basic level of technological or social skills, so that they could participate in a more specialised work-focused development programme. The emphasis in preliminary programmes was more on individual skills and learning, often following a formal pattern. Pilot programmes on the other hand had more of an organisational focus and gave companies the chance to try out and refine their proposal before implementing them on a wide scale.

Aluminium Dunkerque, Manducher and Bord na Mona carried out preliminary training.

Prospective employees in Aluminium Dunkerque underwent 1 100 hours of general training comprising scientific, technical and social topics and skills. This training was carried out in collaboration with the regional bodies before the start-up of the plant. Manducher likewise arranged a formal and general education courses for existing and newly recruited employees. Bord na Mona focused on equipping its existing workforce with cost-management skills which were essential for effective performance in the autonomous teams envisaged.

As regards pilot development programmes, Bord na Mona introduced its new forms of work on an experimental basis and subject to joint management–union monitoring. Felten & Guilleaume tried out and evaluated production islands and learning circles in one department of the company initially. Sara Lee also began its

LEARNING INCENTIVES	COMPANIES
Formal career ladders	Aluminium Dunkerque
Financial rewards for learning	Manducher
Recognition and portability	Cadbury
Standard-based assessment	



overall programme with a number of developmental projects, one of the most important being a training course for first line management.

3.5.2. Learning incentives

The standards-based assessment system utilised by Manducher, Aluminium Dunkerque and Cadbury was used as a basis for career progression within the firm. Aluminium Dunkerque went one step further in gaining recognition by external public training and professional bodies of company assessments, thereby assisting competence portability and job mobility. Cadbury was in the process of establishing links between its internal assessment procedures and the UK National Vocational Qualifications Awards standard-based system.

The same three companies also introduced a financial award system based on the development of new skills – a concrete expression of their belief in the value of competence development.

3.5.3. Learning and development processes

In general terms most of the companies surveyed tended more towards what can be termed informal learning rather than formal training as a predominant approach. Informal learning according to Autoplastique refers to the 'learning effects of how work is organised'. Formal training did play an important role, however, as we have already seen for example with regard to preparatory courses, and many of the enterprises utilised standardised courses appropriately, in particular to meet individual technological skill development needs.

Before proceeding to provide illustrations of what the companies meant in practice by informal learning approaches, it is worthwhile examining the relationship between learning processes and work processes.

Informal learning implies that people learn as a result of being given, or taking opportunities to learn in the course of their work. This can be realised only if certain conditions are in place, the principal one being that workers can exercise a degree of control over how they plan, execute, evaluate and reflect on the work they have to do. The work environment on the shop-floor can promote or hinder learning therefore depending firstly, on the degree to which workers' autonomy is fostered and secondly on the manner in which company management provides work-based learning frameworks such as learning circles (Felten & Guilleaume) and work-place pedagogics (Volvo).

As can be observed in the figure above, the workplace of many of the companies in this study tended to favour local control (and decision-making) by the workers. The related

LEARNING APPROACHES	COMPANIES
Informal learning Dunkerque,	Audi/VW, Volvo, Bord na Mona, Aluminium Felten & Guilleaume, Autoplastique, B&T, Clark Hurth
Line managers as learning agents	Bord na Mona, Aluminium Dunkerque, Felten & Guilleaume, Clark Hurth, Manducher
Fellow workers as mentors/coaches	Manducher – Autoplastique
Formal learning	Audi/VW, Aluminium Dunkerque, Felten & Guilleaume, Sara Lee, Cadbury
Modular approach	Cadbury
Self-instruction	Cadbury, Aluminium Dunkerque
Assistance of external consultants and training bodies	Aluminium Dunkerque, Felten & Guilleaume, Sara Lee, Manducher, Cadbury
Joint assessment	Aluminium Dunkerque, Manducher, Cadbury

learning frameworks that were in place meant that the informal learning processes were supported by a high degree of planning and structuring. One of the exceptions was Bord na Mona for whom learning occurred in the teams principally as a result of being given full responsibility for how they undertook their work – 'the learning environment, which emerged, was a very informal one'. It was a question of being thrown in at the deep end. Workers received a limited number of preliminary lessons, but in the context of the crisis, which the company was going through, they were forced to make it largely on their own.

The B&T group were also forced to learn, rather than assisted to learn, because they had to borrow management's authority (decision-making) to resolve the problems they were faced with. The informal learning patterns in Autoplastique likewise were not complemented by the delegation of decision-making to the workers.

3.5.4. Specific informal learning approaches

The specific informal learning approaches implemented by at least eight companies cover a wide spectrum displaying rich diversity (see figure below). In the Audi/VW for example special 'learning-oriented flexible manufacturing' cells situated in the real work environment are used. Learning methods include the use of 'cognitive learning strategies' such as 'heuristic rules'. In Volvo the term 'workplace pedagogics' refers to learning to understand and work in terms of cognitive wholes.

The informal learning strategy put into operation by Aluminium Dunkerque initially entailed 'planned on-the-job learning'. Following on from this was a continuous learning programme based on the review of one's performances in 'real work situations'. Learning in teams was coordinated by middle management staff with the assistance of internal training facilitators and outside consultants.

In Felten & Guilleaume learning circles were the focal point within which individual and group learning needs were identified and training programmes agreed.

What were termed cooperative learning strategies were used by Autoplastique. This meant

COMPANY	INFORMAL LEARNING APPROACHES
Audi/VW	‘Learning oriented flexible manufacturing cells’ (‘decentralised work-based training’) ‘Cognitive learning strategies’ (‘heuristic rules’) ‘*Leittextmethode*’ (‘guided discovery learning texts’)
Volvo	‘Workplace pedagogics’ (learning to understand and work in terms of ‘cognitive wholes’)
Aluminium Dunkerque	Start-up phase: planned on-the-job learning according to eight stages in a job Continuous learning programme based on a review of one’s performance in real work situations
Felten & Guilleaume	‘Learning circles’ (work-based learning groups to identify needs and decide on programme to be followed) Middle management changed from being knowledge holders to moderators and coaches
Autoplastique	‘Cooperative learning strategies’ Learning as a by-product of the work of the project team One-to-one learning (based on a learning contract (*contrat de qualification*)) Coaching (*tutorat*)
Manducher	‘Close-to-the-job learning’ Experienced workers (*multiplicateurs*) and older retired workers acted as trainers ’ ‘Discussion circles’

learning in one’s project team, where learning was seen as a by-product of teamwork. One-to- one learning approaches based on a ‘learning contract’ (*contrat de qualification*) and coaching (*tutorat*) were also used.

One of the terms used to describe informal learning in Manducher was ‘close-to-the-job learning’. Experienced workers who were called *multiplicateurs* were designated to carry out individualised training in special training rooms near the workplace. Older (retired) workers also acted as trainers on a part-time basis.

The trainer in Clark Hurth identified training needs by means of formal contacts with work groups and informal contact with individual operators and tuners. Technical work groups were set up under the supervision of the trainer to resolve special problems.

With regard to formal learning, Cadbury followed a modular training approach to assist the development of cross-trade technical skills at craft level. Self-instruction approaches were available in Cadbury and also in Aluminium Dunkerque.

The assistance of external consultants and training bodies was central to Cadbury’s strategy as well as a number of other companies. The modular programme in Cadbury’s and the initial first-line management programme were designed by external agencies. As already described, local public training authorities played a very important role in Felten & Guilleaume and Aluminium Dunkerque programmes.

In the latter company also, as well as in Manducher and Cadbury, progress in learning was carried out on a joint basis. This meant that competence was assessed jointly by the front-line supervisor, the employee and the external consultant. To facilitate this process Manducher utilised a competence grid covering technological, production and social skills.

4. Conclusion

4.1. Detecting the difference between 'espoused theory' and 'theory in action'

Chris Argyris (1978) coined the terms 'espoused theory' and 'theory in action' to make the distinction between what people say they are doing and what they really do in practice. Reality often does not match the rhetoric. This study affirms this hypothesis. While most of the companies examined described their behaviour as being in line with forms of management giving greater autonomy to employees and supporting learning organisation principles and actions, the reality for three of these companies (displaying an unwillingness to let go of traditional 'tight control' management and organisational models) was very different. This was true of many other companies which identified themselves at the beginning of this project as innovative, competence development oriented companies, but on examination did not bear up to the way they described themselves. The framework for evaluating the three different levels of implementation of innovatory practices, developed in the course of the project, could be a useful research instrument in evaluating the experiences of companies in general.

4.2. Variety of pathways to achieve the same goal

Another interesting conclusion to this study is the variety of pathways which the featured companies took in achieving similar goals. Successful innovation can originate from many different starting points and follow a variety of pathways, that is, providing all of the necessary stages are gone through. This is illustrated by the fact that while three of the companies, Aluminium Dunkerque, Manducher and Volvo introduced new organisational and learning models in a very logical manner, beginning with the adoption of new values and the drawing-up of an overall long-term plan, other companies (in particular Bord na Mona) displaying a responsiveness to events occurring within the company – learning from them – went on to implement radical solutions entailing major changes in management's attitude towards the position of employees as stakeholders in the company.

4.3. The fragility of social (human resource) innovation

Another concluding reflection on the cases examined in this study, which is linked to the last point above, is the fragility of social or human resource innovation. In the first place, opportunities to implement the innovation process can so easily be lost. This study has shown how opportunities for radical innovation to respond to modern business needs, which were grasped by some companies, were allowed to slip away by others. An interesting example in this regard, not outlined in the study, relates to the Cadbury case-study. A different Cadbury factory in the same location as the one featured in this study was also the subject of an innovation exercise around the same time. However, the renewal process did not take off there due to a combination of factors, one of them being the inability of that company to move away from its traditional adversarial industrial relations practices. While one company took the opportunity to move forward, its sister company did not. Secondly, the study also shows that social innovations that have taken ages to build up can be destroyed very quickly. The Volvo case, and to a much lesser degree the other Swedish case, B&T, demonstrated how easily achievements based on enormous commitments and a great deal of work were lost overnight.

4.4. Innovation a highly complex process

The experiences of those companies, which embraced radical 'worker centred' competence strategies, show it to be a very complex process demanding vision, risk-taking and a long-term commitment.

As outlined in this paper the companies which made the change had the following five characteristics.

- senior management had visionary and leadership qualities characterised by a capacity to see work activities, business development and organisational and individual learning goals in a systemic context;
- both management and workers (and their unions) displayed an ability and a willingness to take risks in moving beyond existing mind-sets and begin to shape a new reality for the company;
- soundly-based and well-researched frameworks were used by the companies in effecting the change process;
- all of the stakeholders in the companies (management and workers at all of the different levels and trade unions) were involved in the 'whole-system' change process (not top-down) which was characterised by pragmatic cooperation;
- all partners in the change process were committed to the implementation of detailed, time-consuming and sometimes very difficult steps required in the change process – very different from the 're-engineering' philosophy.

4.5. Competence profiles

The competence profiles of the employees of the companies featured in this study must be understood primarily in relation to the context of the particular enterprise they were working in, and only secondarily in relation to formal public qualification profiles. Employees were at the same time being shaped by, and shaping, this context. In the first place, the demands on the company to establish working patterns to enable them to respond to competition in a globalised market-place determined the kind of competencies required of the workforce. Secondly, the need for the company to devise effective 'long-term' strategies to respond to, and indeed have an impact on the environment (or anticipate changes in the environment) required individuals to play a part in building the 'collective knowledge' or competence of the company and at the same time reshaping/enhancing their own competence profiles. (See Nonaka and Takeuchi, 1995).

The knowledge required by employees in the study was, to use the terms of Erault (1997), 'personal' as distinct from 'prepositional' knowledge. According to Erault, prepositional knowledge is codified knowledge which is given foundational status by incorporation into publicly recognised qualifications. Personal knowledge on the other hand 'is acquired not only through the use of public knowledge but is also constructed from personal experience and reflection. It includes propositional knowledge along with procedural and process knowledge, tacit knowledge, and experiential knowledge in episodic memory. This allows for representations of competence, capability or experience in which the use of skills and propositional knowledge are closely integrated.' (Erault, 1997, p. 552). This distinguishes an experienced-worker (an expert with personal knowledge) from the beginner-worker (a novice possessing in the main propositional knowledge). (See Dreyfus and Dreyfus, 1986.)

4.6. How learning took place

In the light of the last point above, it is not surprising that the predominant learning approach used within the companies was situation-based learning. Although all of this learning is grouped together under the heading of informal learning in this paper, it would be a mistake to see this as haphazard or unplanned learning, (although there is a certain truth in the statement that the best way to improve learning in a company might be to change the organisational culture and then the learning would look after itself).

The key feature of the learning approaches of the visionary companies studied, was the planned provision of opportunities for collective and individual reflection on ways in which the company could improve its performance, benefiting in the long run both the company and the individuals working there. In many cases these reflections led to focused on-the-job learning solutions based on 'the reflection-based learning cycle' with, for example, an expert teaching a less experienced person, but it also included the introduction of formal learning (training) programmes where appropriate. The reason why the predominant learning approach in the companies is called 'informal learning' is to highlight the importance placed on 'contextual learning', that is learning embedded in the working process of the company as distinct from formal context-free knowledge. (While on the one hand much of this knowledge could be seen as what is referred to as company-specific knowledge, not having any benefit to the individuals in a personal career development sense, it is also true that this learning did provide individuals with personal knowledge in the sense in which Erault uses it (or core/key competencies) which built up their specific occupational and general competencies and promoted their employability in modern labour markets.

4.7. European values and traditions

While the companies examined illustrated the changing but continuing influence of European industrial and human resource values and policies in the business world to-day, there are also clear signs that globalisation trends are challenging these values. Sparrow and Hiltrop (1994) identified six features of continental European human resource management traditions which distinguish Europe from the USA. In Europe, according to these authors, there tends to be (a) more restricted employer autonomy; (b) less stress on free-market processes; (c) less emphasis on the individual with more on the group; (d) greater focus on workers rather than management; (e) increased role of 'social partners' in the employment relationship; (f) higher levels of government intervention or support in many areas of human resource management.

Most of the above features can be found to a greater or lesser extent in the companies examined which placed a strong emphasis on highly skilled workers as the backbone of the enterprise. An important role was also assigned to collective trade union representation and the influence of national government support frameworks, be they financial and/or advisory, could be seen in many cases. Although the European emphasis on creating macro-societal frameworks to promote social cohesion by means of government industrial and social regulations, including the importance of social partnership and the protection of individuals' rights, was not explicitly discussed in any level of detail in the study, but underlies the daily life of most of the companies examined.

Nevertheless, it is also clear that global free market competition is strongly challenging European (more specifically continental and Nordic) work-related values. In this regard, globalisation is pressuring all companies, that wish to compete in world markets – and all markets are becoming global more and more – to devise similar state-of-the-art organisational structures based on the concepts of efficiency and flexibility, for example world class manufacturing. The development of flexible workers is, in many cases, a direct challenge to the notion of profession or occupation (giving people an identity or role and characterised by traditions, standards, values and membership of a professional group) which is broader and different from the company role. A short-term and too lopsided view of the business dimension noticeable in the competence profile of workers can have a negative impact on overall professionalism in the above sense.

In terms of competence profiles, the European way (professional/occupational identity approach), can be seen as situated midway between the individualistic job orientation of the USA (project-based and in line with a flexible unregulated labour market) and the corporatist/company (job for life) perspective of Japan (in line with the notion of the clan, family or cohesive group and based on the internal flexibility of the company). The challenge for European players (social partners, enterprises and government) in the industrial, business and vocational education and training areas is to find a way to modernise companies so that they can compete in the global market while at the same time not lose sight of local, national and European societal values and goals which provide continuity and stability.

Some specific issues facing human competence and business development in Europe and deserving of further study are as follows:

1. the creation of frameworks bringing together the human resource development (HRD) business orientation (in particular the humanistic HRD schools) with the vocational education and training (VET) professional identity and personal development perspective;
2. building coherent 'holistic' professional/occupational profiles (new professions/occupations) – including business and societal perspectives – which are flexible (broad enough and deep enough) to deal with globalisation and which have an in-built predisposition towards lifelong learning (employability);
3. designing learning strategies and curricula which can address the above;
4. designing accreditation systems which provide frameworks for interpreting the above competence profiles, incorporating the 'personal knowledge' (Erault) or 'core/key competencies' acquired and so allowing for transferability to other contexts.
5. development of training professionals who can carry out their new roles as facilitators of learning within the context of learning organisations where the line management has responsibility for ensuring that learning takes place;
6. examining ways in which trade unions find their role in the new modernised organisation finding a balance between individual and collective representation methods.

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B. Skill and competence needs of small and medium-sized enterprises (SMEs) and for the creation of new companies

John Konrad (1)

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Summary and outlook

The most important issue in this field is to increase the survival rate of SMEs through access to effective training and development processes that meet their short and longer-term needs. This would increase employment, encourage a flexible, decentralised economy, and with flexible procedures and flatter organisational structures typically found in SMEs, would promote social inclusion.

The promotion of suitable education for both new and existing entrepreneurs is a worldwide issue, which is given added urgency with the continuing internationalisation of the labour markets. The broadening of the knowledge base of entrepreneurs is an issue where different countries and regions are developing examples of good practice in common.

One of the most effective strategies is to develop the competence of professional workers at all levels as reflective practitioners through a progressive ladder of rigorous qualifications. This approach appears likely to meet identified SME needs when linked to a broad competency model that promotes both individual and organisational development and avoids simplistic mechanistic prescriptions.

Structural measures to promote SME survival and growth as high performance enterprises include business incubators, research and development or technology centres or parks and apprenticeship promoting programmes. The development of links between such measures and SME education and training is quite often inhibited by market failure in labour and human resource development.

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The following recommendations are being made:

1. Further research should be undertaken to identify significant aspects of institutional structures at local, regional and sector levels, which contribute to improving the effectiveness and efficiency of the labour and human resources at the respective level.
2. The development and proper implementation of parameters for high quality education and training based on the reflective practitioner model should be subject to pilot project developments and linked to use and possible refinement of the European credit transfer system (ECTS) in ways that meets the needs of prospective and current employees of SMEs.
3. The European Commission should use the opportunity presented by the new programme structures associated with its Agenda 2000 to promote effective locally coordinated action that provides a high-quality work force.
4. Collaborative conceptual, action, and applied research on the development of comprehensive competencies and qualifications for owner-mangers should be a high priority for all actors, policy makers, social partners, and practitioners.

I. Context

1. European Union

The European Commission's enterprise policy was presented to the Madrid European Council of 1995 (2). The Commission then prepared the integrated programme in favour of smes and the craft sector (3). This paper has been elaborated for the European Centre for the Development of Vocational Training (Cedefop) and more especially for its handbook 'European trends in occupations and qualifications'. It ought to be located within the priority and objective designed to 'strengthen the competitiveness of SMEs and improve their access to research, innovation and information technologies and to training'. Objective D of the enterprise policy objectives refers to a particular focus to 'stimulate management training' (4).

The Commission has adopted a recommendation (5) concerning the definition of SMEs, which applies to all European Union programmes and is as shown in the table on p. 231.

In addition to meeting the criterion for number of employees, an enterprise must meet *one* of the financial criteria, and it must be independent in that less than 25 % is owned by one or more enterprises falling outside the above definition.

The 1993 European Commission's White Paper *Growth, competitiveness and employment: The challenges and ways forward into the 21st century* outlined the EU's approach to increase employment and to combat social exclusion, while also encouraging a flexible, decentralised economy.

More recently, the Commission has sent to the Council of Ministers a set of priorities on fostering entrepreneurship in Europe. These proposed priorities include the promotion of specialised training in enterprise management and the development of synergy between universities and enterprises (6).

The role of SMEs in the EU economy

SMEs employed two-thirds of the EU workforce in 1995, and in 1996, 19 million SMEs were set up with 110 million employees. However, current Commission figures indicate that

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(2) *Small and medium-sized enterprises: A dynamic source of employment, growth and competitiveness in the European Union*, a report presented by the European Commission, COM(95) 2087.

(3) COM(94) 207 final, 3.6.1994.

(4) COM(96) 329, 20.3.1996, available from http://europa.eu.int/en/comm/dg23/guide_en/entpol.htm

(5) *Definition of SMEs*, OJ L 107, 30.4.1996, p. 4 available from http://europa.eu.int/en/comm/dg23/guide_en/definit.htm

(6) *Fostering entrepreneurship in Europe: Priorities for the future*, COM(98) 222 final, Brussels, 7.4.1998, available from http://europa.eu.int/en/comm/dg23/smepol/finalen.pdf

	Medium-sized	Small	Micro-enterprise
Maximum number of employees	< 250	< 50	< 10
Maximum turnover (ECU million)	40	7	–
Maximum balance-sheet total (ECU million)	27	5	–

only half of SMEs survive after the first five years of operation (⁷).

'Net job creation in SMEs has more than compensated for job losses in large enterprises during the period 1988 to 1995. Enterprises with fewer than 100 employees have been responsible for almost all the job creation at a rate of 259 000 net jobs per year.' (European Commission 1995: 3) (⁸)

The same report identified SME training as a case of market failure in labour and human resources.

'Although qualifications are a key to competitiveness, training in SMEs is undertaken significantly less often than in large companies, partly because the training does not meet SMEs' needs. Initial training programmes do not always provide for the necessary multi-disciplinary skills and core competences they need. Traditional away-from-the-job training is often unsuitable for SMEs and the training infrastructure is notoriously weak in sectors dominated by SMEs. ... However, there is still insufficient creation of business and jobs in this sector (craft industry and small enterprises), due to a still inadequate level of vocational and management training for apprentices and potential new entrepreneurs. ... In the medium and long term, education and training should aim to encourage an entrepreneurial culture which will lead to business start-ups and job creation ...' (European Commission 1995: 6, 12).

Overall, the picture of apparent stability in the proportion of workers in SMEs masks not only high turnover due to business failure, but also the swing away from manufacturing to service employment, especially in sectors such as tourism which in 1996 made up 6 % of total employment (European Commission 1997: 3).

The existing 'dual system' of vocational education and training (VET) in Germany and some other EU Member States developed in the 1950s. At this time large manufacturing employers needed a rational, planned and systematically trained workforce. With the collapse of the centrally controlled command economies in eastern Europe and the shift towards the open, customer-focused variable production characteristic of SMEs, future patterns of training and education are likely to require open, learner-centred pedagogy. This entrepreneurship-orientated training is more likely to be provided away from the employers' premises in order to meet the wide range of needs and situations (⁹) (McFarland 1997: Chapter 11).

A recent research study on training provision for SMEs commissioned by the UK Department for Education and Employment (DFEE) which reviewed a wide range of research in the UK, North America and Australia confirmed many of the above findings. In particular, the research concluded that:

- a manager or an employee of an SME is less likely than one who works for a large firm to receive training, particularly job related or leading to an accredited qualification;
- there is no obvious reason or conclusive evidence that the quality of training provided in small firms is worse than that provided in large firms;

(⁷) European Commission, *Fifth report on European Observatory for SMEs: introductory meeting*, Brussels, 25.11.1997 http://europa.eu.int/en/comm/dg23/guide_en/speech/eosmeen.htm

(⁸) However, over the same period (1988–95) enterprises employing 100+ employees lost an average of 222 250 jobs per year (Graph 5).

(⁹) There are some examples of innovative apprenticeship placement schemes for new graduates, for example the Companies Assisted Partnership Scheme (CAPS) in West Yorkshire (UK).

- the 'market forces' explanation for the lower level of training in SMEs is more plausible than the 'ignorance' explanation in that:
  - owners of SMEs are mainly concerned with short-term survival while many of the benefits of training, especially those leading to accredited awards, are longer term and represent significant returns to the individual and the economy rather than the employer;
  - employers believe that trainees in small firms will be poached by other (and larger) employers (¹⁰);
  - there are less market forces and, for managers, less promotion opportunities, within an SME;
  - the wide range of needs exhibited by SMEs leads to diseconomies of scale for training providers (¹¹).

A local study confirms that there appears to be a mismatch between government policy stressing qualification achievement, and employers' priority for high quality, flexible, customised and company-specific training (Konrad et al. 1998).

2. Asia–Pacific Region

Outside Europe, the most active area for development in supporting SMEs has been the Asia Pacific Economic Co-operation (APEC) group. Following the establishment of the Ad Hoc Policy Level Group on SMEs (PLGSMEs) in February 1995, a number of projects and workshops were established. Projects for 1998 include the creation of a distance learning training programme and the establishment of certification standards for small business counsellors (¹²).

The report of the second joint US–EU conference 'Education and Training for an Innovative Work Force' held in San Diego in November 1994, has recently been published by the National Centre for Research in Vocational Education at the University of California at Berkeley (¹³) (McFarland 1997).

The common challenge faced by both the US and the EU is that under global pressure, businesses have to become much more responsive and demand flexible production, high skills, and innovative workers. One of the US responses to this challenge has been the establishment of 'incubators' which link SMEs and colleges more closely (¹⁴).

The 'business incubator'

A US survey of entrepreneurs and business incubator managers was published in 1996. This identified the following entrepreneurial characteristics:

- business skills;
- entrepreneurial skills;
- technological skills;
- motivational skills;
- interpersonal and communications skills.

About one-third of the respondents felt they had no need of training and development services, with a similar proportion valuing individual on-site training and consultancy, and another quarter using periodic seminars. The largest group of the entrepreneurs (40 %) had learnt their business and technical skills by 'working for a company' with 'undergraduate/graduate coursework' accounting for 18 % and 33 % respectively. The three main skill areas where further education and training was required were business (29 %), entrepreneurial (18 %), and technological (17 %). These results confirm the view that specific skills complement the personal qualities of the entrepreneur. The study also indicated that universities were more appropriate sources of this education and training than two-year colleges (Hernades-Gantes et al. 1996).

(¹⁰) However, this view has been refuted by other UK research (which argued that training led to lower labour turnover) supporting 'the notion that employers train workers they wish to retain so that they can benefit from any skill upgrading that results from training.' (Dearden et al. 1997: 1).

(¹¹) This is another reason why training providers should receive encouragement and incentives to develop open and flexible approaches to education and training.

(¹²) Policy *Level Group on SMEs: Report on activities*, APEC Secretariat, Singapore, 1997. Available from http://www.actetsme.org/apecsme/plgsme.html

(¹³) Obtainable at http://vocserve.berkeley.edu/MDS-1073/

(¹⁴) Business incubation is defined as a strategy to foster local economic development (Hernades-Gantes et al. 1996).

Local research and development institutes in Japan

The Japanese government has been continuously carrying out support measures for the technological upgrading of small and medium-sized enterprises (SMEs). These measures have used the unique scheme of 'kosetsushi' or public research and development institutes which aim to remove obstructions to technological development and actively challenge SMEs to develop their own technologies to meet economic change. This approach is based on the result of government research that found that 70 % of the SME sector lacked support in the development of new products. The local (prefecture) government manages the kosetsushi with central government providing financial support. There are currently 200 kosetsushi in the 47 prefectures with a total budget of USD 1 000 million. The largest institute has more than 200 engineers, while 14 have more than a hundred. In aggregate, they deal with some 450 000 technological issues and questions annually.

Technological training to meet local needs is provided at cost for local SMEs, with support and consultancy in the use of the latest processing and measuring technologies provided free. This approach has the benefits of promoting networking and communications which often enables SMEs to support and supplement each other's needs, thus achieving a broader take-up of new technologies than would normally occur with individual firms (Nakazawa 1996).

Overview

A common response to these issues has been to stress the importance of locally coordinated action where leadership emerges from local government, schools and colleges, business and community-based organisations (in the UK, the Training and Enterprise Councils/Local Employment Companies performed a crucial role in the first half of the 1990s). The Japanese approach is highly pragmatic, emphasising promotion of cooperation and networking between SMEs with central financial support provided through local government.

The influences on local action depend on a variety of factors. In times of prosperity when skill shortages become a major issue, employers are likely to be interested in participating in programmes linking education and business and training initiatives directed at improving the supply of higher level skills. In general, the research indicates that the main concern of low level operative and technology training is to help SMEs deal with practical problems that threaten their survival. As SMEs become more mature and stable, they become more interested and disposed to becoming involved in longer-term issues such as raising the level of formal competencies through formal accreditation (15).

If this essential provision of individualised support achieves a significant improvement in the survival rate of SMEs, workplace learning will also provide a basis for medium term developments of accredited competencies leading to vocational, undergraduate and postgraduate qualifications. The provision identified in the next section is an example of the type of provision that achieves this goal.

In addition, central government or EU initiatives, such as the New Deal or ADAPT programmes create quality frameworks and incentives for local programmes. The major incentive at a local level is the possibility of inward investment, which often depends on the availability of appropriately skilled workers and which can exert a major influence on the development of the SME sector as part of the supply-chain.

II. Review of current provision of qualifications for SMEs

1. Development of university qualifications

The last decade has seen a number of innovative developments of qualifications at undergraduate and postgraduate levels in which the curriculum is defined by the work of the individual undertaking the qualification. The United Kingdom has provided a number of examples of such innovations.

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(15) Hardill and Wynarczyk (1996) identified that textile SMEs who used information technology successfully and achieved higher levels of growth had directors who were more likely to have a formal qualification and to have established a formal management team.

1.1. Three case studies from the United Kingdom

- The University of Stirling has developed the Learning in Small Companies (LISC) which works in partnership with local colleges to create a number of work-based learning schemes leading to awards at pre-university level (16) as well as a Certificate in Small and Medium Enterprise Management (CSMEM). A total of 28 companies, mainly within the geographical area covered by the Central Scotland Local Enterprise Company (Forth Valley Enterprise), participated in the project. The companies came from a range of industrial and commercial sectors and ranged in size from the micro level to the upper limit for SMEs. Although some company managers were less interested than employees in qualifications, those based in the workplace were more likely to gain the support of employers. The project tapped a reservoir of latent demand from those groups of employees who did not traditionally participate in continuing professional development (CPD). The attraction of the CSMEM was as a custom-designed qualification in general management for SMEs (17). In line with the European Commission's 1995 White Paper on Education and Training (18) recommendation for 'reintroducing the merits of a broad base of knowledge', the CSMRM is being developed through Leonardo da Vinci development funding as a transnational distance learning programme (19).
- The National Centre for Work-based Learning Partnerships at Middlesex University (20) enables people to use learning from work to gain credit for academic programmes from a single module, to whole awards at certificate, diploma, degree, and postgraduate levels. Specific modules are provided which enable participants to plan their own programme of learning using a mixture of planning, knowledge and skill development, and project modules (21). This uniquely flexible approach enables individuals to meet the needs and aspirations of their organisations and themselves. One of over 50 partnerships developed is the formation of a B.Eng. degree with Anglia Polytechnic University for suppliers to the Ford Motor Company (22).
- In the School of Professional Education and Development at Leeds Metropolitan University, the Short Course Accreditation Scheme (SCAS) provides a framework that enables employers to accredit internal staff training and development against academic credits both UK CATS and European CATS. Progression is provided by a linked undergraduate/postgraduate award scheme where work-based learning programmes can be accredited up to a maximum of 50 % of the credits for a particular year. The remaining credits are earned through further modules, which mix taught modules (through direct teaching or distance learning), independent study modules, and projects (23). The University is building on its existing transnational European partnerships to plan the development of an accredited undergraduate programme for workplace trainers and mentors using the Socrates institutional contract and the mechanism provided by Action 6 of the Erasmus programme.

These examples of programmes that meet the needs of full-time employees are particularly appropriate to the situation of SMEs where there is a wide diversity of need, coupled with a lack of sufficient numbers to make conventional courses viable. In the examples of good practice referred to in this section, care has been taken to ensure that the staff involved in the management and delivery of this type of programme are fully supported by the policy and infrastructure of the University. In two of these examples, EU research and development programmes have provided the means of adapting the innovation to the differing systems of Member States.

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(16) Scottish Vocational Qualifications (SVQs); Scottish Vocational Education Council (SCOTVEC) National Certificate modules and Higher National qualifications; and a University Access Course.

(17) *The executive summary of the project report*. University of Stirling, 1996 is available on http://www.stir.ac.uk/epd/lisc/exect.html

(18) Available on http://europa.eu.int/en/comm/dg.22.html

(19) The European Leaning in Small Companies (ELISC) project. Details are available on http://www.stir.ac.uk/epd/elisc/index.htm

(20) Further details on: http://alpha2.mdx.ac.uk/www/ncwblp/welcome.html

(21) Details are provided on: http://alpha2.mdx.ac.uk/www/ncwblp/wblprogrammes/hndbk_tit.html

(22) For details and students' views, see: http://alpha2.mdx.ac.uk/www/ncwblp/GeneralInfo/partnership.html

(23) For details see http:/www.lmu.ac.uk/ces/ped/

These developments are not confined to the UK and there are many parallel developments in Australia where an important study identified the characteristics of the learning methods used by successful work-based learning programmes (Candy et al. 1994):

- peer-assisted and self-directed learning;
- experiential and real-world learning;
- resource-based and problem-based teaching;
- reflective practice and critical self-awareness;
- flexible and open learning delivery.

The Australian experience of learning from reflection has been very influential, especially the concepts of preparation and reflection-in-action (Boud and Walker 1991).

1.2. The Australian experience

Southern Cross University is located on the coast in northern New South Wales. Through the Graduate College of Management, the Master of Business Administration (MBA) offers a range of electives through distance learning, including the use of teleconferencing; with opportunities for face-to-face contact at weekend workshops on and off-campus. The programme operates a trimester calendar year that ensures that staff are available for 44 weeks in the year. The full MBA is awarded on completion of 12 units, with a Graduate Diploma awarded for 8 units and a Graduate Certificate after 4 units (24). Entrepreneurship and small enterprise is one of the specialist streams, which introduces a primary unit on 'concepts of entrepreneurship' (25). This unit is a coherent part of a formal academic 'focus on management of the major business functions and business strategy. … Study materials are designed to emphasis the link between the conceptual knowledge gainer and "real world" practice.' (26)

This example indicates the limited extent to which the traditional MBA model can be adapted to SME needs.

1.3. North America

The W. Maurice Young Entrepreneurship and Venture Capital (EVC) Centre, University of British Columbia, Canada was founded in 1992 as a research centre, which supports degree programmes especially the MBA in Entrepreneurship and undergraduate coursework. The Centre also runs workshop for local SMEs, principally in the area of business planning.

The MBA is designed for students who will initiate their own venture or join emerging new enterprises (27). The structure of the programme is conventional, with a specialist core module in Entrepreneurship and New Venture Creation and option modules in Corporate Entrepreneurship, Technology Entrepreneurship, and Managing the Privately-Held Business. Although this MBA programme is more specialised towards the high technology start-up companies than the previous example, it is mainly concerned with the education of new entrepreneurs.

The School of Business and Economics at California State University, Los Angeles follows a similar approach (28). The School offers an undergraduate option in Entrepreneurship and a Certificate programme in Entrepreneurship and Small Business (29).

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(24) The full course information guide is available at http://www.scu.edu.au/schools/gcm/mba/cig.htm

(25) See http://www.scu.edu.au/schools/gcm/mba/mn737.htm

(26) The prospectus may be viewed on http://www.scu.edu.au/schools/gcm/mba/prospect.htm

(27) MBA outline is available at http://pacific.commerce.ubc.ca/evec/mba.html

(28) School prospectus is available at http://www.calstatela.edu/academic/business/mktg/entrepre.htm

(29) Details are available at http://www.calstatela.edu/academic/business/mktg/entcert.htm

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The Donald H. Jones Centre for Entrepreneurship in the Graduate School of Industrial Administration at Carnegie Mellon University conducts research and provides an entrepreneurial management programme for chief executives and founders of small and mid-sized companies (30). Participation is targeted at companies who employ 20 or more people with annual earnings of over USD 1 million. The 20-week three-hour seminars are based on the graduate programme in entrepreneurship. The School also offers specialist undergraduate and graduate programmes where 'students learn the methods and philosophy of the entrepreneur and begin to view business from the entrepreneur's perspective.' (31) In addition to courses in Entrepreneurship and Entrepreneurial Management, opportunities are provided to gain credits through management projects, collaboration in the development of new products and independent studies. These involve students working as consultants with owners of small businesses in the local Pittsburgh area.

It is worth recalling Robert Reich's discussion on the role of symbolic analysts who 'simplify reality into abstract images that can be rearranged, juggled, experimented with, communicated to other specialists, and then, eventually transformed back into reality.' (Reich 1993: 178)

The effect of major universities and research centres, particularly when combined with good international communications is to act as a magnet for the most able and entrepreneurial.

'America's symbolic-analytic zones remain, for the most part, wondrously resilient. Within them, America's symbolic analysts continue to improve their abilities to solve, identify, and broker ever more challenging conceptual problems.' (Reich 1993: 240)

Overview

These innovative university-level qualifications have met the need of SMEs for flexible and individualised programmes of accredited learning which educate and train working professionals as 'reflective practitioners' (32).

2. Sub-university (further education) level

2.1. United Kingdom

Four National Vocational Qualifications (NVQs) for owners of small businesses were approved in June 1996 (33). Of these, only one has attracted significant numbers of candidates. The two owner-manager qualifications are summarised below, together with the number of certificates awarded as at 30 September 1997.

This approach to the training and education of SME managers is still at an early stage, with only about 18 months since these qualifications were approved (34). At the same time, the mainstream management standards were revised in 1997 for the first time since 1990. In this context, the achievement of almost 1 000 awards at level 3 in the first year would seem to be quite significant. With the improvements currently under way in the quality and reliability of NVQ assessment, the relevance and impact of this qualification is worthy of further research (35).

2.2. Australia

Open Learning Australia coordinates a small business management training programme that covers:

- individual modules/groups of modules such as negotiation, communication, management and leadership, and interpersonal skills;
- the Certificate in Small Business Management (150 hours minimum) a nationally

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(30) Details available on http://www.gsia.cmu.edu/afs/andrew/gsia/EntC/management-programs/no-js-index.html

(31) Entrepreneurship *Education*, http://www.gsia.cmu.edu/e-ship/education.html

(32) This concept is normally associated with Kolb's (1976) experiential learning model; Donald Schön's influential books on the topic of reflection – *The reflective practitioner* (1983), *Educating the reflective practitioner* (1987) and *The reflective turn* (1990); and Revans' (1983) *Action learning model*.

(33) These qualifications were developed by the Small Firms Lead Body, approved in 1996 and are awarded by The Institute of Management Foundation.

(34) When these qualifications were launched, they were criticised as failing to recognise the holistic approach needed to meet client needs. (Banfield et al., 1996)

(35) Some indications of the approaches required may be found in Jennings et al., 1996.

Qualification	Level	No awarded
OWNER MANAGEMENT – Business management and development	**4**	**1**
• **Mandatory units** (5)		
• Develop the business plan • Implement the business plan • Improve own management of the business • Manage the finances of the business • Review the performance of the business		
Optional units (3 out of 9) • Develop a credit control policy • Develop and implement the marketing plan • Develop and implement the sales plan • Develop the contribution of people to the business • Export products and services • Obtain finance for the business • Obtain and manage business premises • Plan the finances of the business • Purchase products and services		
OWNER MANAGEMENT – Business planning	**3**	**998**
Mandatory units (3)		
• Determine the legal and financial requirements for setting up and operating the business • Generate the business proposal • Plan the business operation		
Options (3 out of 4) • Determine the requirements for monitoring and controlling business operations and quality • Evaluate and develop own practice • Plan the human resource development within the business • Plan the marketing strategy for the business		

recognised and accredited programme delivered through self-paced distance learning by Institutes of Technical and Further Education (TAFE);

- a Graduate Certificate of Small and medium Enterprise Management is provided by one University on a 26 weeks/620 hours taught/distance mode. It is designed for both those entering SME management and those wishing to advance and gain recognition for their existing knowledge and experience.

An interesting example of a TAFE programmes is described below (36).

Certificate III in Small Business Management (Transport and Distribution Industry)

Aim of course
This course is for people entering small business management or who are currently working within the transport and distribution industry and would like to update or increase their skills.

This is an accredited course, involving a nominal 200 hours of study.

Entry requirements
None.

Context
The course was customised for the transport and distribution industry – especially for

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(36) Information supplied by Claire Brooks, Course Tutor Wodonga Institute of TAFE, Victoria (personal communication).

women whose partners were truck drivers, couriers or taxi drivers. This course has been very successful and has been recognised as a great equity (i.e. contributing to equal opportunities) programme. This was partly because we included a comprehensive recognition of prior learning program as well so the women did not have to do things where they could demonstrate competence (e.g. time management). The groups who complete the course are people who are new to a small business or thinking of setting one up.

Duration
Students can complete modules at their own pace. However, it would be possible to complete all the modules in 12 months.

Module		Cost (AUD)
OL670	Introduction to small business (compulsory core)	56.00
OL552	Financial record keeping for small business	56.00
OL671	Marketing and sales promotions	28.00
OL672	Customer relations for small business	28.00
OL673	Time management	14.00
OL551	The business plan	28.00
OL674	Monitoring business performance	42.00
OL675	Customer-driven business strategies	21.00

Module descriptions

Introduction to small business

This core module introduces the concepts and factors required to start or run a successful business within the transport industry. It examines the legal, marketing and financial implications of setting up a small transport business.

Financial record keeping for small business

Enables the potential small business transport operator to set up and use an effective financial recording system, including cash journals, debtors, creditors, and petty cash and bank reconciliation.

Marketing and sales promotion

Covers the concept of marketing, market size, share, research, and marketing mix as well as pricing, distribution, promotional and competitive strategies.

Customer relations for small business

Covers effective customer service, increasing the total number of customers, providing quality goods and services, identification of customer needs, staff training in customer service, handling customer concerns and complaints, self-presentation, strategies to increase average sales per customer and quality standards.

Time management

Covers time/task relationships, effective time management practices, including common time wasters and ways to avoid them, a time management plan, changing behaviour and the use of time management tools.

The business plan

Covers the format and purpose of the business plan, processes for successful planning, the marketing plan, the operational plan, and the financial plan.

Monitoring business performance

Covers establishing and using measures of day-to-day profitability and financial stability including, cash budgets and effective stock control systems relevant to the transport industry. Examines target setting and performance evaluation against set targets.

Customer-driven business strategies

Introduces the strategies that disclose customer perceptions and reactions to the transport and distribution industry products. Develops a quality plan that will remedy short-term deficiencies and produce long-term acknowledgement of a consistent quality product.

As against this, the following view was expressed on the generality of these courses.

'Normally small businessmen like us do not do the courses available at the TAFE colleges in Australia. Maybe that's why so many fail in the first 12 months of operation. The people that usually go to these courses are young people that have just left school and before getting a job or maybe get a job and one of the requirements is that they must go to this type of course. The other advantage with this course is if you are planning to enter into the corporate world then it's a good springboard to that.' (37)

2.3. Canada

There are occupational guidelines for small business owner-operators produced by the Sector Councils Steering Committee Secretariat at the Canadian Labour Force Development Board (38).

III. The nature of competence, using competencies at work – the UK experience

Definitions

The early 1990s saw a growing debate on the nature and definition of competencies that focused on the chosen approach to competency. 'These competency frameworks are based, to a lesser or greater extent, on the following (alternatives):

- A competency model which relates to 'an underlying characteristic of an individual which is causally related to effective or superior performance in a job' (Boyzatis 1982). Competencies are expressed as the behaviours that an individual needs to demonstrate.
- A competency model which relates to 'the ability to perform activities within an occupation to a prescribed standard' (Fletcher 1991). Competencies are expressed as minimum standards of competent performance.' (Strebler et al. 1997: 3)

These distinctions are extended by a critical appraisal of the methodology of functional analysis used to develop the National Vocational Qualifications (NVQs).

'The notion of competence applied here has two characteristics. First, that competence consists of specific behaviours on the part of individuals and that certain behaviours lead to superior performance. Second, that these behaviours are associated with personal qualities which are capable of being learned and developed. Boyzatis proposes that effective performance will occur when three components are consistent with each other. They are:

- the individual's competences;
- the job's demands; and
- the organisational environment.

This would suggest that competence is situation specific. (Stewart and Sambrook 1995: 97).

In practice, the theoretical distinction between the behavioural and competence models is often blurred in practice. The most important issue is that employers and employees should be clear about the focus (individual or job) and standard of performance (non-competent or competent or effective or superior).

The starting point for the development of competence-based qualifications has been the analysis of occupational functions. This involves a group of experts in the methodology of functional analysis, rather than the particular area of occupational competence, carrying out a top-down analysis of an occupational area using a model of competence-based on 'the whole work role' (39).

In the behavioural model, competencies help to define the values of the enterprise as being concerned both with individual and business development. A typical example is the use of the Investors in People UK National Standard (40).

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(37) Kevin Newman, Owner of Sailz Boutique Holiday Villas (in personal communication), May 1998.

(38) No details were available at the time of writing, despite an e-mail request to info@councils.org

(39) Mansfield B. and Mitchell L., *Towards a competent workforce*, Gower, London, 1995.

The 'minimum standards' approach to competency is increasingly associated with the introduction of performance management and competency-based pay. (Industrial Society 1996) The newly privatised UK sectors, such as telecommunications, water, electricity and gas (the 'utilities' sector) have made particular use of this approach. Standards-based qualifications (in the UK, S/NVQs) have been associated with the early 1990s, rise in unemployment, lack of job security and growth of multi-skilled rather than mono-skilled employment. The contributory impact of financial institutions seeking to maximise shareholder value to the neglect of other stakeholders, especially the workforce, has recently been highlighted as a problem against the background of high rates of job creation in the US economy (Reich 1998).

The fundamental weakness of the UK approach to competence-based qualifications is related to the functional analysis approach referred to above.

'It is clear from the critical appraisal presented here that functional analysis has arguable weaknesses at a number of levels...its philosophical and conceptual base is problematic, and empirical assessment of its application suggests failure to achieve claimed and expected benefits.... There are two major implications ...

First, ... the result of this conception of competence and functional analysis is a concentration on a narrow range of technical skills. Therefore, enhanced skill levels are unlikely to be developed.

Second, purposes and values other than those associated with employment, which are traditionally pursued through education, are likely to be marginalised. ...

It is clearly our view that the method cannot be accepted as a valid and reliable tool for constructing a national system of vocational qualifications.' (Stewart and Sambrook 1995: 104–105)

This view is supported by a study of 'expert workers' which showed that 'expertise', unlike 'competence', depended on both the amount of specific skills possessed and the ways that the workers organised their knowledge. (Cornford and Athanasou 1995). In addition, there is some evidence from the UK engineering industry to support the EU 'social partnership' approach in that trade unions, workers' expectations, and past history will have an important impact on training decisions (Heyes 1993). Distinctive management styles and business cultures, especially related to new technology and management development also limit the usefulness of the narrow, mechanistic approach of the current NVQ standards (Fletcher and Hardill 1995).

The above analysis indicates that the original NVQ model of competence-based qualifications was flawed. The small group of enthusiasts in control of development did not consider the fundamental methodological and ideological critiques of the approach. This UK approach to workplace learning relied on a narrow, mechanistic, and somewhat incoherent framework of professional levels. The current reforms of the NVQ system, which are due for completion by September 1999, will need to be firmly rooted on rational, coherent procedures based on a modern, constructivist, cognitive framework, as well as being closely linked to the emerging needs of the enlarged EU. Further research is required to monitor the impact of the NVQ model and other competence-based qualifications on the needs of SMEs for accreditation of work-based learning.

Overview

This study suggests that the behaviours where development and assessment are easiest are those that employers regard as the least important for the medium and long-term growth.

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(40) Investors in People is the UK national quality standard for effective investment in the training and development of people to achieve business goals. The Investors in People Standard provides a framework, (not a blueprint) for improving business performance and competitiveness, through a planned approach to setting and communicating business objectives and developing people to meet these objectives. It recognises that all companies are different, and will have specific strengths and areas for growth. The result is that what people can do and are motivated to do matches what the organisation needs them to do.

Ease of assessment and development of competencies: users' views

Easy to assess	Hard to assess	Easy to develop	Hard to develop
Communication	**Vision**	*Technical skills*	**Interpersonal skills**
Technical skills	**Interpersonal skills**	*Planning and organising*	**Problem solving and decision making**
Planning and organising	**Soft and behavioural competencies**	*Communication*	**Soft and behavioural competencies**
Measurable outputs	**Problem solving and decision making**	*Knowledge*	**Leadership and motivation**
Team work	**Financial and commercial awareness**	*Customer awareness*	**Vision**
Analytical skills	**Analytical skills**	*Measurable outputs*	**Analytical skills**

The softer skill areas are difficult to assess because of the way they are defined, overlap with each other, are relative to particular situations, and are difficult to change (Strebler et al. 1997: 48–59).

The flexible, individualistic and reflective strategies developed at university level do not fit the narrow, standardised and mechanistic approach used by the original competence-based qualifications. As the range and level of competitive pressures on SMEs intensifies, high performance enterprises are those characterised by sound management development strategies (Quale 1994, Smallbone et al. 1995).

This study has identified a consistent pattern in the needs of SMEs for qualifications that accredit the competencies, knowledge, and insights that promote survival and growth. Whilst the qualification frameworks will vary according to the particular structures of qualifications in Member States, the relevant common principles are relevance, flexibility, accreditation of workplace learning and the development of the reflective professional.

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C. New developments in qualification strategies for sectoral and regional innovation

Loek F. M. Nieuwenhuis (1)

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Summary and outlook

This contribution is targeted at the role of vocational education and training in facilitating innovation in small and medium enterprises. Companies' innovation is seen as an embedded process within regional, sectoral and chain-bound networks. The role of VET is shifting from delivering initial education for youth and adult training towards facilitating interaction and common learning activities in local industrial networks.

Several case-studies have been presented to understand industrial innovation processes and linked actions within various networks. The role of VET colleges in these innovation processes is still rather marginal. To become 'spiders' in regional innovation networks, VET colleges have to develop towards learning and networking organisations themselves.

Introduction

Innovation and its speed of implementation are crucial factors for the competitiveness of enterprises and industrial sectors, regions and local agglomerations. Innovation is a complex process based on interactive network learning and includes trial and processes on the shop floor on the one hand, and research and technology development on the other hand. For small and medium-sized enterprises, this innovative process should be facilitated by out-of-company institutes. Both sectoral and regional organisations for supporting innovation and transfer of new knowledge and technology should play a role.

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(1) Stoas, Department for Research on Education and Employment, Wageningen, The Netherlands

This contribution is targeted at the role of vocational education and training (VET) in the innovative process of early- and late-adopting enterprises. A major prerequisite for this role is that the VET-system is able to cope effectively with the challenge of responsiveness: flexible responses to new skill requirements, both in initial education of young people and in the continuing training supply for the older labour force. Responsive VET can be an important instrument in the dissemination of R & D results addressed at SMEs. VET training centres and colleges ought to function as pivotal actors within regional and local innovative learning networks of enterprises.

1. Understanding innovation

Innovation is important for the competitiveness of companies and industrial sectors, regions and local communities. The main line of thought stems from evolutionary economics, in which the dynamic aspects of economic development are central (see Dosi and Nelson, 1994). Schumpeter (in Kleinknecht, 1994) between the wars formulates the process of creative destruction, in which enterprises with old-fashioned products are expelled by enterprises with new products (competition on substitution and not on prices: see Jacobs, 1996). Innovation and technology development is the main tool to survive this dynamic process. Protection of 'old' enterprises hinders the process of creative destruction, which should lead to under-investment in innovation. According to Kleinknecht, investments in R & D lead to increasing export and job growth on enterprise level. Innovative enterprises are more resistant to economic crises.

National and European policy-makers believe in massive investments in technical-oriented research programmes as a major impulse for innovation. The production of new knowledge and technology is the prime target of these programmes, which are built on a firm trust in the usefulness of research efforts for companies and service organisations. On the other hand, the results of science and technology development are quite often not easily implemented in the daily routines and production processes of companies. Small and medium-sized enterprises in particular meet problems adopting new knowledge. To facilitate the implementation of R & D results, sectoral and regional innovation centres were developed in the Netherlands during the 1980s. But even such centres do not reach the majority of companies. Many of the difficulties in transferring new knowledge and technology to small and medium enterprises are caused by the linearity of the knowledge transfer models used. To understand these difficulties, the knowledge transfer process has recently been studied in more detail. Research studies on innovation (see Coehoorn, 1995; Engel, 1995; Röling 1992) show that linear models for knowledge transfer should be replaced by interactive models, in which trial-and-error processes on the shop floor are interrelated with the existing knowledge base and research infrastructures.

Verkaik (1997) defines innovation as the development of new products, services and processes which can be made valuable and applicable in a rather short term. Innovation differs from technology development and fundamental research, both concerning its time horizon and in terms of the economic-cultural context. Innovation, (technology) development and research represent three different kinds of knowledge generation, relating to each other in a kind of living-apart-together: sometimes they interact strongly, sometimes they are only loosely related.

Dosi (1998) describes the microeconomic processes of innovation. Data on R & D and patenting show only a glimpse of innovative activities: innovation is often built into 'learning-by-doing' situations. According to him, four types of innovative processes can be discerned:

- formal R & D;
- informal knowledge diffusion through journals, organisations, mobility and observation;
- learning-by-doing and using in problem solving behaviour;

- purchasing knowledge through machinery and tools.

Innovation is, according to Dosi, problem solving: ill-defined technical problems have to be solved through creative 'learning', based on formal and tacit knowledge. Tacit knowledge is important in relation to the appropriateness of innovations: the comparative advantage is depending on it. Innovations are cumulative; they are built on former activities and in-company knowledge, what hinders the imitation of innovation by competitors.

Innovation is not a random process, but based on historically rooted main roads depending on technological paradigms: innovative products are built on older technologies and products (a main reason for that is linked to consumers' demands). Innovation is (partly) predictable via zones of near development; the technological state-of-the-art defines the next problems which have to be solved with new inventions. Technological paradigms are characterised by specific learning strategies, which leads to reduction of uncertainty.

Company internal knowledge and routines lead to a prevalence for the company's internal innovation. Even in the case of purchasing new tools, internal capacity is needed to implement the new knowledge. Innovative companies are built on their own core-competence (Hamel and Prahalad, 1992). The embedment of innovations within this core-competence and internal learning processes is the best protection against imitation.

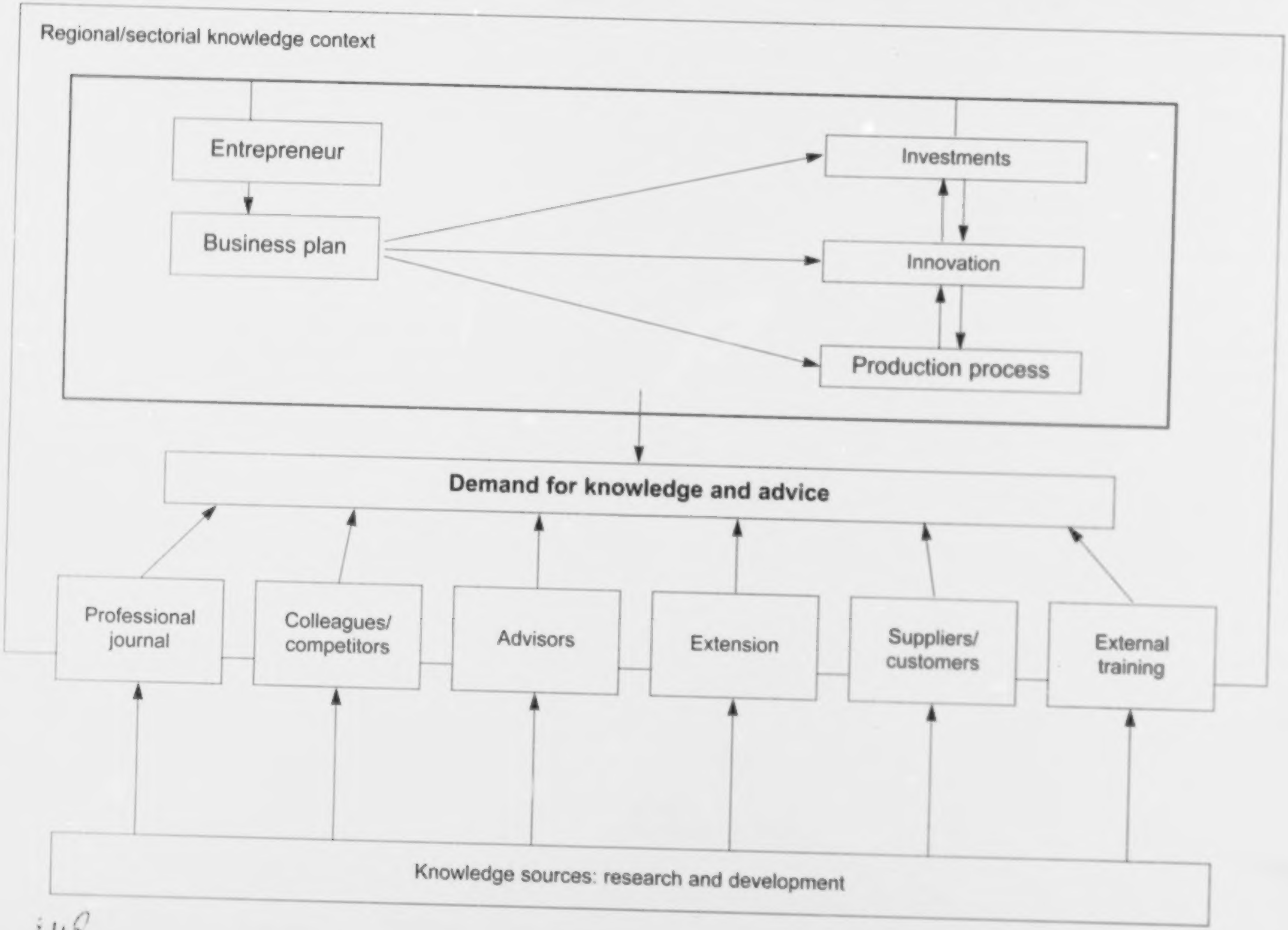
Competitiveness, innovativeness and internal craftsmanship are fundamental elements of a healthy company. Maintenance of these important elements asks for a specific knowledge management. Detecting and using external knowledge sources and the organisation of internal learning processes are central aspects of modern management. Oerlemans (1997) regards innovation as an embedded process within a broader knowledge context in which the exchange of learning and technical sources is elementary, especially for SMEs. Economic networks are crucial to transform heterogeneous knowledge sources into useful new combinations.

Innovation leads to company-specific knowledge (tacit knowledge; see Dosi 1998, Nonaka and Takeuchi 1994, Attwell and Brown in this publication), which strengthens the 'forward' position of innovative enterprises. Tacit knowledge is dependent on people: it is important to have long-lasting contracts with the core of the employees. Hartog (1996) states that the new economic order asks for an increased flexibility of workers on the one hand (higher skills, life long learning), but on the other hand for job security. Flexibility should be translated into trainability and learning skills and not into external flexibility.

Problem-solving and innovation through trial-and-error processes are part of informal learning processes, in which social networks play an important role. Workers learn by sharing knowledge in the working team and employers learn by creating networks of colleagues and advisers. However, the relation between innovation and competencies is not unequivocal. A reciprocal relationship seems to exist: the skill level within enterprises is a prerequisite for innovative activities; on the other hand innovation may also lead to a certain obsolescence of skills, which underlines the need for re-skilling and further training.

2. Knowledge context and knowledge sources

A company's innovation is an embedded process. Companies are not solo players in the knowledge and technology field. According to Oerlemans (1997), companies are embedded in various knowledge spaces. Innovation is an embedded process; knowledge and technology are exchanged within networks of collaborative companies and institutions. The innovative process can be characterised as a combination of existing knowledge with new combinatory knowledge. To organise this combinatory process, companies need to collaborate with other companies and knowledge institutes. This is especially the case for small and medium-sized companies, because they do not possess large internal knowledge sources and research potential. For effective innovation, small and medium-sized companies have


Regional/sectorial knowledge context
Entrepreneur
Business plan
Investments
Innovation
Production process
Demand for knowledge and advice
Professional journal
Colleagues/ competitors
Advisors
Extension
Suppliers/ customers
External training
Knowledge sources: research and development

thus to use external knowledge sources. Non-profit or public agencies and innovation centres on the sectoral and regional level, technical colleges and universities may play this important role of back-up service for SMEs. In addition industrial local and regional networks are necessary for the transformation of knowledge into new innovative combinations and products.

The external knowledge context is complex for SMEs. The figure on page 246 gives an overview.

The entrepreneur or the employer, with his/her skilled employees, is continuously involved in problem-solving and innovative processes. In the first instance, he looks for internal solutions. But very soon the use of external sources will become a necessity. Professional journals, financial advisers, suppliers and customers will bring in new knowledge deliberately or accidentally. So an interactive exchange of knowledge will develop around internal company processes and their external relations. The enterprise is embedded within an expanding knowledge space. The knowledge space surrounding companies is multidimensional; at least three dimensions can be discerned: the product chain, the professional sector and the socioeconomic region.

With the product chain dimension the relevance of user-producer and producer–customer relations is pointed at. Learning and innovation are taking place through the exchange of product requirements and quality information systems.

With the professional dimension the exchange of knowledge between professionals within competing companies is indicated. In many cases common interests exist, pushing competitors into collaborative innovative activities.

On the third dimension, knowledge exchange is seen as a process between companies in the same (sometimes virtual) region. Direct contact via observation, discussion and mutual shop floor visits is an important feature of knowledge exchange. Also the supply of skilled labour is spatially bound.

Depending on socioeconomic preconditions, strategic decisions have to be taken on all three dimensions; the balance between common interests and competitive advantages is depending on many variables.

2.1. Chain knowledge or knowledge chains?

Enterprises exist within product chains. They need raw materials, tools and machinery to be able to produce their products and services, which in turn should be tuned to specific needs and requirements of their customers. Chain management is an important new field of business management, targeted at inter-company relations: product-accountability, quality information exchange, logistics for transportation and stock-keeping are major subjects in this field.

Knowledge development and collaborative innovation should be part of the chain management, however, the sources for innovative activities are not always located within the producing enterprise: according to Von Hippel (1988), the source of innovation is located within the supplier–producer–user chain, depending on the expected benefits and production, chains are important units for analysing innovation processes.

Caused by the tacit aspects of innovation, by the partial appropriateness of new technologies and the cumulative character of innovation, enterprises are developing differently or in different directions. If the introduction of new products has been successful, innovative companies are often able to define economic rules for their competitors. Innovation leads to comparative advantages. Imitation and diffusion lead to convergency. Depending on market figures, enterprises are increasingly pleading for a kind of 'collaborative innovation'. Within supplier-dominated chains, collaboration is easier to realise.

2.2. The sectoral dimension

Industrial sectors have their own possibilities to scaffold innovative activities within SMEs. According to Finegold (1991) industrial sectors should look for ways to facilitate cooperation between enterprises and common activities to enhance investments in training and innovation. They tend to set up low-skill traps: individual enterprises will decrease their investments in human resources if they are endangered by poaching behaviour of their competitors. So, industrial sectors have to look for policies which will scaffold cooperative behaviour in training and innovation; trade unions can play a facilitating role.

Based on cooperation between companies, sectors should be able to build sector-bound infrastructures for technology transfer and training policies. In order to scaffold these sectoral policies, systems are needed for the monitoring of future technology developments; the results of monitoring activities can be translated into transfer supporting measures and skill requirement forecasts.

Sectoral challenges to facilitate innovation and learning processes are: establishing preconditions for collaboration between competitive enterprises in the field of training and innovation; building future-oriented monitoring systems for technology development; building support systems for company bound innovation and training; defining of key competencies for skilled workers and entrepreneurs; creating sectoral ownership for vocational education and training systems.

2.3. The regional dimension

Morgan (1997) stresses the importance of the network paradigm in understanding regional development strategies. He emphasises the importance of creating learning regions, analogous to the concept of learning organisations, as building up collective learning capacities between geographically related enterprises and regional infrastructural provisions/opportunities. Strong industrial districts seem to be characterised by learning interrelationships between enterprises. Italian industrial regions and districts are characterised by their monostructures in terms of products and services: each district is famous for a single set of products. Learning and exchange of expertise is essential to keep the quality of this set at a guaranteed level. Other emerging regions are characterised by chain relations: exchange of innovation and information is related to purchasing and selling activities. These kinds of learning networks are strong because of their promotional impact on economic activities.

In less developed regions these kinds of learning networks are non-existent, because of a lack of economic activities and an inadequate infrastructure. The challenge for regional and local authorities is to establish education, training and labour market policies which lead to a high level of learning potential and an emergence of networks for the support of SMEs and starting entrepreneurs as a part of their economic policy. Innovative VET-provisions could even more substantially lead to an improvement of the innovative capacity within regional economies (see Morgan, 1997) and give decisive impulses for regional and local economic development, so one of the challenges is to improve these provisions.

To reach that target, regional VET providers should act in a proactive way and in strong alliances with other knowledge providers such as innovation centres and sectoral knowledge centres. This is one of the targets of the regional development programme of the European Union's Regional Funds policies, for example the European business and innovation centres, targeted on the interrelation between SMEs and higher education, can scaffold these developmental programmes.

Regional policies which serve to enhance industrial innovation and learning processes are in the main: learning networks of enterprises; facilitating infrastructures for technology transfer; educating and training a highly skilled labour force. Meeting these challenges is one major condition for stimulating regional economic development. Regional and national governments, however, have restricted options to facilitate knowledge networks: establishing intermediate organisations, enhancing fundamental research and development and maintaining vocational education and training are mentioned as the main governmental instruments in this respect (see OECD, 1997).

2.4. VET as part of the knowledge context

For building competitive regional economies, VET is a major player as has been shown by

Rosenfeld (1998) at a recent OECD conference. Next to the supply and maintenance of a skilled labour force, a new task is indicated for technical colleges: the brokering of (new) knowledge towards the local economy. This implies regional strategies for economic development, of which VET should increasingly be an integral part.

VET on the sectoral level is also present as an important actor. The promotion and accompanying of the ongoing process of building and rebuilding a rapidly changing occupational identity is an important instrument to promoting economic activities. The vocational courses and qualifications play an important role in this promotional process (see De Bruijn and Nieuwenhuis, 1994). At the same time, however, the foundation, implementation and development of technical and vocational courses and curricula are often based on skill definitions from a specific professional/occupational group, both on its skills and competencies and its professional/occupational interests, which, however, sometimes do or do not coincide with larger socioeconomic needs. Trade unions and employer organisations play their roles in the defining of vocational courses in German and Dutch apprenticeship systems and in the formulation of national vocational qualification standards in the UK system. VET is delivering and developing occupational standards, interacting with the professional sectors. Employers and skilled workers use their professional institutions for maintaining and upgrading their skills. Innovative shifts in occupational requirements often stem from developments within the educational system. So, on the sectoral dimension VET has powerful potentials for facilitating innovation within SMEs.

The production chain is a rather new perspective for analysing innovative processes and related skill developments. Joint innovative activities are often based on a chain of linked relations between enterprises, but skill developments are not related yet to chain developments. However, whereas production chains have a large potential for new economic and innovative perspectives, this is an interesting new area for developing VET strategies (see Bertzeletou in this publication).

3. On the delivery of skills and competencies

3.1. Delivering work process knowledge

In the theory on human capital, knowledge and skills are mainly identified on the individual level. Hommen (1997) argues that this approach denies the social dimension of knowledge and skills. Knowledge is a collective good within communities of economic and social practices. Knowledge is developed within the complexity of work environments, which are not bound to individuals or jobs, but dispersed within a group of workers. This view is compatible with the evolutionary vision on innovation: economic organisations (institutional communities) form the core units to understand innovative practice. Innovation is the common, active reconstruction of work and processes: proactive instead of reactive.

Companies should develop towards reflective communities based on high skilled work. Berryman and Bailey (1992) develop a comparable argument for the US economic development. Companies should develop towards learning organisations and will need highly-skilled workers.

The traditional design of vocational education and training shows strong parallels with the design of traditional workplaces: traditional education is built on simple learning patterns compatible with the traditional workplace. This traditional workplace is not well suited for innovation and knowledge creation: companies have to change and so has vocational education and training.

Berryman and Bailey suggest the model of cognitive apprenticeships as an alternative, with a strong research tradition (cf. Raizen, 1989; Nieuwenhuis and Mulder, 1998). Learning of symbolic and abstract concepts should be replaced by learning in functional contexts. An elaboration of this model is proposed in four blocks (see Collins et al., 1989): content, methods, sequencing and sociology of learning.

Content: target knowledge for an ideal learning environment includes domain-specific conceptual, factual and procedural knowledge and

	Characteristics of ineffective learning	Characteristics of traditional workplaces
1	Limited transfer	Narrowly defined jobs and tasks
2	Learners are passive vessels: Reduced exploration Dependence on teacher 'Crowd control' problems	Passive order-taking in a hierarchical work organisation; heavy supervision to control workers
3	Strengthening the bond between stimuli and correct response	Emphasis on specific responses to a limited number of possible problems (deviations from the expected are to be handled by specialised service personnel)
4	Emphasis on getting the right answer: No attempt to get 'behind' answer Little learning from mistakes Little emphasis on how to think about problems	Emphasis on getting a task done rather than on improving its subsequent performance
5	Decontextualised learning	Focus on the specific task independent of its organisational context.

Source: *Berryman and Bailey, 1992, p. 71*

three types of strategic knowledge (tricks of the trade; cognitive strategies; learning strategies). Schools usually focus on domain-specific knowledge. Strategic content is needed to operate effectively with domain-specific knowledge.

Methods: teaching methods should be designed to give students the chance to observe, engage in, invent or discover expert strategies in context.

Sequencing: learning should be staged so that the learner builds the multiple skills required in expert performance and discovers the conditions in which they can be generalised.

Sociology of learning: the learning environment should reproduce the technological, chronological and motivational characteristics of the real-world situations in which what is being learned will be used.

This type of situated learning does not automatically imply on-the-job learning: traditional workplaces do not have much learning potential. Prerequisites for lifelong learning and innovations are situated learning in vocational courses combined with newly designed workplaces within 'learning work organisations'.

3.2. Three roles for vocational education and training

In order to enhance knowledge transfer processes vocational education, training and further or continuing education and training should play three important roles (see also Rosenfeld, 1998):

- education and training of new employees and employers to structure the knowledge base in companies;
- the supply of up-to-date information and training facilities to update the knowledge and skills of the workforce;
- the organisation of active networks of enterprises to facilitate interactive learning processes.

Technical colleges and training institutes should accept the challenge of improving within their own efforts the knowledge transfer process by ensuring a high degree of responsiveness to the results of research/science and (technology) development. Regional training colleges, supported by sectoral innovation centres, have the opportunity to become a pivotal pole in the learning networks of small and medium-sized enterprises, by implementing innovative knowledge from the R & D infrastructure into their course supply and linking more closely to local networks and companies. Central in the model are intermediate structures established by economic and industrial sectors to enhance communication between R & D and VET systems. These intermediate structures are depending on features of both, the sectoral training system and the innovation.

VET is standing at the crossroads of regional and sectoral policies: labour markets are regionally defined; the supply and demand of employment is spatially bound because of mobility limits. Craftsmanship on the other hand is highly sectoral bound, because of the intertwining between occupational domains and economic activities. Educational policies in VET are more or less connected to sectoral policies, depending on national VET-systems and socioeconomic constraints. VET-institutions have to build on both sectoral and regional networks to operate effectively in supplying a well qualified labour force, prepared for lifelong learning within an innovative socioeconomic and employment situation.

4. Case studies on new qualifying strategies

The empirical base for this contribution has been established in former case studies; they have been undertaken in several Dutch industrial sectors representing a large proportion of SMEs (Grooters and Nieuwenhuis, 1996; Lokman and Nieuwenhuis, 1998; Gielen and Nieuwenhuis, 1998). The intermediate knowledge infrastructure in several industrial sectors was studied and comparative analyses were made of the role of vocational education and training in facilitating innovations in enterprises.

Based on these cases a sectoral/regional innovation model has been built, in which four actors play a major role: SMEs, R & D-infrastructure, sectoral innovation agencies and VET institutes. SMEs have to be innovative to improve their competitiveness; they use knowledge from different sources but they also produce new knowledge as a result of their innovative activities. Institutes for research and development produce a lot of new knowledge, but they meet problems in disseminating and, even more so, in implementing that knowledge towards SMEs. In several industrial sectors innovation centres have been established and were targeted on the translation of innovative knowledge towards the sector-bound enterprises. Not only were public funds made available, but also the social partners play an important role in the funding of these centres.

Regional innovation centres play a facilitating role in disseminating innovative knowledge. VET provisions have the opportunity to contribute in regional networks through educating young people, training of adult workers and organising learning networks of enterprises.

In the following six cases these aspects of regional/sectoral knowledge contexts are illustrated from different angles. These cases are taken from a Dutch context: in the next two years a European perspective will be added through a Leonardo survey and analysis project called Spidervet: VET colleges as 'spiders' in regional knowledge networks.

4.1. Sectoral delimitation in installation engineering

The installation engineering sector deals with plumbing, fitting, air conditioning and central heating installations. In the last two decades, the sector has defended its economic market share very effectively. The sector is highly dependent on the developments in the building sector: in the design of houses and utility buildings the mechanical installations (lifts, air-conditioning, heating systems and water supply) form a substantial part. Emphasising its professionalism, the installation engineering sector succeeded in keeping its market share. Both employers and workers agree on the basis of their interest in craftsmanship and in the investment in training. For that purpose, each year 1.15 % of the total wages in the sector are saved for training and innovation activities, as laid down in a special collective agreement.

Installation engineering is an innovation following sector: the sources of innovation (Von Hippel, 1988) are located outside the sector. Innovations are designed during integral design processes for utility building or via research and development activities in the supplying industry (e.g. new heating technology). Innovations are disseminated in the installation sector following the linear model. To facilitate innovation processes, the social partners in the sector founded the agency 'Intechnium' (²), the sectoral innovation and training centre.

Intechnium gained, in a period of five years, an important role in monitoring technology developments and translating them into training, adult training and other disseminating activities. For the monitoring purpose, a targeted instrument is designed, whereas for the knowledge transfer towards the regions a directive script is written. In the installation engineering model, vocational education and training have a rather reactive role. Intechnium formulates the training requirements, based on information from its regional member organisations, and is designing the training materials. Vocational colleges are asked to supply the respective courses. In addition, the maintenance of the qualification structure for initial courses is directed within the same monitoring structure.

This model fits well for the linear way of innovative processes in the sector, but it does not necessarily enhance regional learning networks of companies and colleges. The VET colleges are now challenged to initiate such a network, within the sectoral structure from Intechnium.

4.2. Chain relations in the bakery sector

In the bakery sector craftsman-like production has for a long time kept its ground against industrial bakeries. Each represented about half of the Dutch bread market. Today a special threat is the shift in selling points: supermarkets sold 60 % of the bread in 1994. The traditional bakery is thus confronted with a struggle for life. In the Dutch market it is expected that a substantial proportion of the consumers, however, will keep buying their loaves in the small bakery shops. Good craftsmanship of the baker and of his personnel is crucially important in keeping that market share.

Self-employed bakers in the Netherlands are educated at the bakery school in Wageningen, whereas the employees are trained in apprenticeship courses. The selling personnel is educated within the general school system. Employers' organisations and trade unions in the bakery sector are agreed on the importance of training, however, a strong training tradition has not existed.

The bakery sector is rather traditional: large innovations do not occur. Small bakeries did not change dramatically, whereas the industrial bakeries were confronted with process automation, however, at a rather slow pace. Innovation takes place in the form of new equipment, e.g. computer-steered ovens and dough mixers and, on the other hand, via new raw materials and recipes. The supply industry is the motor behind those innovations. The innovational process within the bakery sector can be described as rather slow and linear.

Recently, the National Bakery Centre was founded, in which several sectoral organisations were merged. This new centre has the chance to grow into an innovative focus of the bakery sector. However, the bakery college is at present not involved in this centre. The intermediate knowledge infrastructure in the bakery sector is thus still in a developing stage, communication and information lines are not clear yet. The weak training and innovation tradition, combined with some aversion against centralism, could be an explanation for a comparatively slow development.

4.3. Knowledge systems for greenhouse farmers

Greenhouse farming is a rather prosperous sector of Dutch agriculture. Vegetables, flowers and plants are exported all over the world. Today, however, greenhouse farming is confronted with large shifts in its economic basis. The Dutch government is stepping aside from its leading role in agricultural policy. Economic

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(²) Intechnium, Korenmolenlaan 4, Postbus 484, 3440 AL Woerden, The Netherlands, Tel. (31-348) 43 74 37, fax (31-348) 43 20 13.

developments, both positive and negative, on the global food market will be steering impulses for the agricultural sector. Competition will increase.

This shift is supported by a new policy of the European Union. A major economic tendency is the shift of power in the different food chains. Supported by the European policy, the suppliers in the food chain had for several decades the major say. In the last decade, however, the balance of power has changed in favour of the other side of the chain, i.e. the consumers, represented in the main by the supermarkets. Because of this shift, traditional cooperative structures are breaking down and will be replaced by structures which are better prepared for competition on the international scale.

The structural changes have their impact on the agricultural knowledge system. The knowledge system for greenhouse farming is oriented traditionally on the farmer. Employees in the sector are usually of a low level of education and training. Greenhouse farmers are at the front of interactive innovative processes. Individual farmers or networks of farmers have direct influence on research and development programmes of the institutes for applied agricultural research, whereas the results of research are directly available for the farmers through evening courses and extension programmes.

The economic shifts also affect the way the knowledge system operates. Recently groups of farmers formed competitive promotional activities and consequently the cooperation in the knowledge system is basically affected. At present, agricultural organisations are mainly looking for new ways of promoting the knowledge transfer between research institutes, intermediate organisations and farmers/enterprises. Within the agricultural knowledge system, the role of agricultural education and training has been in danger of a certain marginalisation. Vocational education is still seen as the major supplier of future farmers; however, the role of education/training within the innovation processes in the sector is decreasing. Agricultural education has difficulties especially on the national level in obtaining the necessary information to respond adequately to innovation, and on the regional level the education institutes do not play an important role in the knowledge network around the greenhouse farms. The commitment of the sector to education and training is declining and, therefore, the responsiveness of the whole agricultural education and training provision to the highly changing and open-minded sector seems to be decreasing.

4.4. A linear approach in environmental technology

The Dutch public-private enterprise for the development of energy saving and environmental care technology (NOVEM (3)) aims to facilitate the introduction and spreading of a sustainable and ecological technology by enterprises and entrepreneurs. NOVEM is interested in knowledge and technology diffusion techniques to reach this target. New technology, which is in stock at NOVEM, is not automatically used by companies. Based on the notion of the 'knowledge context of companies' an investigation of knowledge transmission processes within some agricultural sectors (greenhouse farming and bulb breeding) was undertaken. A description of the actual knowledge context has been made and, via interviewing of entrepreneurs and intermediate institutes, the process of knowledge transfer has been analysed.

Within the knowledge transfer and technology diffusion process two major stages can be discerned. In the stage of information diffusion, a linear approach can be used: entrepreneurs learn from reading their economic and professional periodicals or journals and talk with their colleagues and advisers. Information on new technologies ought be channelled through these kinds of informal and formal transfer mechanisms. At this stage a rather broad focus of the information is important: it is not only technical information which should be made available; more integrated information on, for instance, the impact of new technologies on the turnover and benefits of the enterprise is more important.

Entrepreneurs are interested in new technology if, by introducing new tools and techniques, the cost-benefit ratio of their enterprise will improve. A highly effective method for knowledge transmission is the use of information on good practices from innovative enterprises themselves: shop floor visits are most persuasive didactical tools.

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(3) Nederlands onderneming voor energie en milieu, Swnetibolstraat 21, Sittard, The Netherlands. Tel.: (31-46) 420 22 02, fax (31-46) 452 82 60.

The second stage in the technology diffusion process is the moment of problem-solving or investment decisions, to be decided by the entrepreneur. Advisers and regional knowledge organisations should have up-to-date information on their shelves to facilitate the problem-solving process of SMEs. Technology supplying companies should focus less directly on the entrepreneurs, but should target their information, marketing and diffusion activities in the main at the relevant intermediate organisations. For the individual SME-entrepreneur it is impossible to grasp all the available knowledge (energy-saving technology is not the only parameter for his decision processes!); therefore it is important that the regional and sectoral knowledge context offers integral and easy entrance to relevant information combined with the possibility of participating in interactive learning and decisions processes.

This ought to be also the departure point for institutes for vocational education and training. They can claim a role as regional innovation and knowledge centres. Responsive vocational education and training implies a cohabitation of regional and sectoral impulses, in which colleges are increasingly a focal point for collecting, treating and disseminating innovative knowledge in their region. They can strongly support innovations especially in late adopting companies within their region. They can be 'spiders' within regional and sectoral innovation networks.

4.5. Regional networking of Dutch engineering and tool-making industry

The regional economy around Eindhoven, in the southern part of the Netherlands, is strongly based on the engineering industry. Eleven hundred of the 8 000 Dutch enterprises in this sector are located in the region of Eindhoven, including large ones, e.g. Philips (electronics), DAF (trucks) and Océ (copying machinery). Most of these engineering enterprises, however, are small sized: 75 % have 10 or fewer employees. The small enterprises play a role as suppliers to the larger ones. The Eindhoven region is known as a highly innovative one: 50 % of the national R & D budget is spent in this region, notably by larger companies, and about 11 % of the employees in the Eindhoven region are involved in R & D activities.

In the late 1980s, the Eindhoven region was confronted with an economic crisis, but with the help of European and national funds the region recovered and built a strong regional infrastructure of networks and chains of enterprises. Regional intermediary organisations such as the innovation centre and a regional promotion institute play an important role in this structure, as do sectoral organisations of the engineering industry sector organised at national level.

In the Eindhoven region there are a number of large institutes in which knowledge is created, handled and disseminated, amongst them are the Technical University of Eindhoven, TNO-industry (one of the largest private-public R & D organisations), the Technical College (for level 5: professional courses) Fontys, and two regional colleges for vocational education and training (level 2-4). The metal industry has its own institute for adult technical courses and Fontys houses the microcentre (a laboratory for microtechnology). The large companies have their own R & D labs (like the famous Natlab of Philips).

In the 1990s engineering in the region became very prosperous, but a shortage of skilled workers is nowadays an ever greater threat: skill shortages will be the problem for the next decade because of a lack of interest amongst young people in technical and engineering occupations and professions. Therefore employers in the region increasingly cooperate in promoting activities jointly with technical colleges in order to attract new students for technical courses, the natural sciences and engineering disciplines.

Within this dynamic region, the regional college Eindhoven (ROC-Eindhoven (⁴)) was es-

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(⁴) ROC Eindhoven, PO Box 6101, 5600 HC Eindhoven, The Netherlands. Tel.: (31-40) 291 86 86.

tablished in 1996, based on a merger of several vocational and technical institutes (both apprenticeship courses and full-time vocational education). This ROC has 16 000 younger or primary students, 8 000 adult students, 1 400 employees and around 20 buildings in the region. About 10 % of the turnover is generated by specific contractual courses and activities. The innovative mission of the ROC is based on a network strategy: partnerships, collaboration with other regional knowledge institutes, cooperative courses in joint ventures with enterprises.

ICT (5)-based courses and individual trajectories are the main characteristics of the course supply of ROC-Eindhoven. The ROC aims to be an open institute with a regional function. The core competence is restricted to the delivery and maintenance of skilled and highly skilled craftsmanship in the region. Facilitating innovation is not a part of the core activities of the ROC: networking and connecting enterprises and knowledge institutions, however, is the strategy for scaffolding innovation. Delivering skill and qualifications in term of craftsmanship involves all kinds of regular courses and takes into account individual trajectories in cooperation with enterprises or the regional labour supply offices.

The ROC-Eindhoven made a clear choice only to play a restricted role within the region. Within these restrictions, its core competence is elaborated in an excellent manner.

4.6. School management strategies within regional networks

During a short survey schools for agricultural education were investigated about their management strategies as regional innovation centres. All 18 Dutch agricultural VET institutions have been involved in this survey. The most striking result of this survey is that all schools agreed on the necessity of developing a new regional networking strategy, but only one of these schools is in fact involved in regional innovation networks. Regional networking is ranked very high on the priority list for school management, but the operational tools have to be developed yet.

Reasons mentioned for underlining the needs for new strategic developments are linked to their own needs, namely to develop an innovative course supply: fall of demand within traditional occupations, the rise of new ones, and the declining demand from agricultural enterprises for support of innovative processes by the agricultural colleges. A general cause for these processes is the pace of technological development in which the obsolescence of technical knowledge is rapidly spreading and accelerating. The traditionally slow development process for new courses for VET should be replaced by a flexible and responsive course supply. In order to improve the responsiveness of schools, colleges and training centres it is crucial to play a central role within such innovative networks. Colleges are aware of the danger of not being involved in such a network building process, they are conscious that they may leave the risk of losing their supplying role for skilled craftsmanship and of being increasingly limited to the delivery of courses for the low-skilled, for disadvantaged young people and unemployed adults to be retrained.

With this background the agricultural schools and colleges are nowadays starting to develop new strategic options for regional networking and course supply. A major obstacle is linked to staff development problems. Teachers for vocational education and training are educated themselves rather as generalists, whereas operating in innovative networks asks for specialist competencies too. The new networking needs and strategies imply double qualifications for teachers, trainers, tutors and supervisors: both general didactics and specific technologies/competencies should be part of their qualification. Wanting to transform VET institutions into network players demands major investments in the further education and training of the teaching and training staff itself. This is an urgent need anyway.

5. Summarising conclusions

This contribution is targeted at skill and competence needs and the role of vocational education and training (VET) within the innovative processes of early and late adopting, especially the rather small, enterprises. The increasingly high pace of innovations urges VET to develop new strategies to deliver and to maintain skilled craftsmanship for the local, regional and sectoral labour market. The traditional target for initial and regular course delivery should be combined with new targets, tasks and strategies for adult courses and activities, which aim at accompanying and facilitating innovations. Organisations for VET cannot act any more as stand alone institutions, but should develop network-oriented strategies. VET colleges should define their own specific role within 'learning SME networks' and should look for strategic alliances with other knowledge institutions within their regional context.

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(5) ICT: information and communication technologies.

Understanding innovative processes within regional economies should be part of the core competence of VET institutions. Enterprises innovate, embedded within regional, sectoral and chain-bound networks. Enterprise innovation is an interactive process of problem-solving and combining pieces of knowledge and technology into new processes and products. To facilitate these company-specific innovative activities, knowledge creating and disseminating institutions, like VET colleges, should be able to deliver information on new techniques, methods and technologies on time and efficiently. These institutions should organise their own knowledge networks to be able responding to the increasingly chaotic knowledge demand. To develop these organisational and innovative skills, VET colleges and other knowledge creating and disseminating institutes, should become learning organisations with an open mind towards the local economic community and sectoral technology development processes.

Several case studies have been presented to understand industrial innovation processes and linked actions within various network types. Depending on regional and sectoral characteristics, industrial branches organise knowledge and technology networks in order to promote, implement and accompany the innovation process. Local, regional and national governments can smooth innovative processes by certain infrastructural measures, but in most cases the social and economic players and actors are themselves the most important facilitators of their own innovation processes within the respective regions and sector or technical/professional field.

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V. Teaching and learning languages

Chapter V deals with the **teaching and learning of language skills**, that are becoming increasingly important in view of European integration and the spread of internationalisation. It contains one contribution which underlines the prime importance of language skills for vocational education and training, as well as adult education. The contribution deals with the study of languages within vocational education and training and looks at the use of new technology in teaching foreign languages and in the learning process.

Gruber et al. set out the findings of Leonardo da Vinci projects in the field of **'vocationally oriented language learning (VOLL)'**. Language training needs had to be assessed from the point of view of working situations in which languages were really needed. Language learning was of dual significance for working life because it constituted a major element in a person's general cultural development and was an advantage when it came to obtaining a job, either inside one's home country or when taking up the option of mobility available within the Union. The use of modern multimedia training could considerably assist language learning processes. Computer tools would, however, be used in conjunction with other training methods and schemes that would provide contact with the teachers and persons of the mother tongue. Mere training in structural (grammatical) and vocabulary knowledge would not result in real linguistic competence and language proficiency. Concepts on how to use these new forms of training were being developed, together with information on how the new information and communication technologies (ICTs) could be used in language training. These in particular should be of great interest to students learning new languages for use in their job, as well as their teachers.

A. Trends in learning foreign languages within VET, the Leonardo da Vinci programme and the acquisition of foreign languages

Sieglinde Gruber (¹); *Jean-Claude Lasnier, Bernd Rüschoff et al.*

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I. Introduction

'Vocational training – initial and continuing – must place great stress on language learning. This is of dual significance for working life because it constitutes a major element in a person's general cultural development and is an advantage when it comes to obtaining a job, either inside one's home country or when taking up the option of mobility available within the Union' (²).

The White Paper emphasises the proficiency in three community languages (³) as one of the essential means of access to knowledge. This ought, however, be analysed in the complex context of vocational education and training where such an objective may actually seem to be ambitious and not reflect ongoing developments in most if not in all Member States. Rather it should be considered as a medium and longer term objective. At first a number of quite different strategies to translate this objective into reality need to be developed.

In a Europe mobility is of crucial importance for all employees but for workers in particular. Proficiency in several languages does more than simply promote personal and career development: it also contributes to a genuine feeling of European citizenship.

The most important objective is, however, the opening of new prospects for employment and professional mobility beyond national borders. Being multilingual encourages young people to take full advantage of the European dimension in VET, by extending the range of opportunities to all countries where such provision exists.

This question is even more important for existing and future employers: numerous studies have shown that a high proportion of businesses lose significant market shares because they literally do not speak their customer's language, especially where it is one of the lesser-used languages. That is why knowledge of a wider range of languages than the three traditionally used in economic and trade relations – English, French and German – is essential.

Knowing a language and using it in a professional context can take a variety of forms. Some acquire the rudiments of a language to be able to communicate, some are content to

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(¹) The author is working as a principal administrator in DG XXII, the European Commission's Directorate-General for Education, Training and Youth, the views expressed in this paper are personal ones.

(²) European Commission, *Teaching and learning: towards the learning society*, White Paper, Brussels, 1995.

(³) See White Paper, op cit., Objective 4.

develop their reading and aural comprehension, while others will need more advanced skills required to produce complex written documents. If communication is to be successful in a multilingual environment, language training needs to be looked at from the point of view of working situations in which languages are really needed. The content of such training is concerned with a number of elements which include different dimensions: communication skills and job-related expertise, verbal language (competence in one or more foreign languages) and awareness and understanding of cultural issues, different attitudinal patterns etc.

This way, if 'vocationally oriented language learning (VOLL)' is to become a key transferable skill to be transmitted within the different components of vocational training as part of the lifelong learning process, it has to include the above-mentioned elements and it has to be tied in into a comprehensive and integrated approach. What the work environment increasingly requires is integrated communication skills and competencies (key skills or core competencies) to solve demanding and constantly changing holistic tasks. Within this context language learning does normally not follow clear linguistic rules, e.g. from easy to difficult structures, but by communication needs which are closely linked to task-oriented performances. This situation includes easy and difficult language learning at the same time, starting from the first lesson.

In recent years, the prevailing features in language training have been: great flexibility, diversification of methods and materials and also the tendency towards autonomous learning. No method is practised in its entirety; the training and learning of languages increasingly rely on dynamic research into the range of approaches and methods available (including the so-called alternative approaches such as suggestopaedia and play- and drama-based approaches, such as role-play etc.). As a result, a wide variety of methods and techniques have been developed and applied to meet the specific objectives of the communication needs in changing environments.

Thanks to recent developments in information and communication technologies, more emphasis is now put on methodological approaches that simulate authentic professional situations and plan the language contents in linking these to codes that are used in integrated work situations. Functional language learning does not always fulfil the needs of people at work; therefore the learning sequences need to be structured in a different way: authentic situations, however complex, help the learners further in their communication and task-oriented performance than fragmenting the situations into easily teachable units.

II. Language learning with the assistance of ICTs

The Leonardo da Vinci programme (^{4}) continues to support, via the channels of information and communication technologies (ICTs), innovative approaches and new developments in vocationally oriented language learning. Thanks to the increased performance of computer processors and the large storage capacity of optical media, off-line multimedia training and the respective software, for instance on a CD-ROM, are experiencing a high surge in both quantitative growth and quality. Since 1995, distance training via the Internet has become something of a craze, firstly as a contact interface with a trainer, then as a real multimedia training vector facilitated by integrated services digital networks (ISDN). Also for the first time ever, the majority of successful language projects in the 1996 Leonardo da Vinci call for proposals opted to produce electronically-based materials rather than print-based materials (see Table 1).

Development of training material or software for the Internet in 1996 was as popular as the development of CD-ROMs; however, there seems to be an increasing interest in using the Internet as compared with CD-ROM if we compare figures from 1995 with those from 1996 (see Table 2).

New information and communication technologies (ICTs) have enormous potential in the facilitation of language acquisition. They provide access to language in action through, for example, video and audio conferencing. They can cater for different learner types, styles and pace. Problems related to access such as time and location are alleviated. They are attractive, up-to-date and easily tailored to specific needs,

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(^{4}) Strand III.1.

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Table 1
1995 and 1996 Calls — Types of material

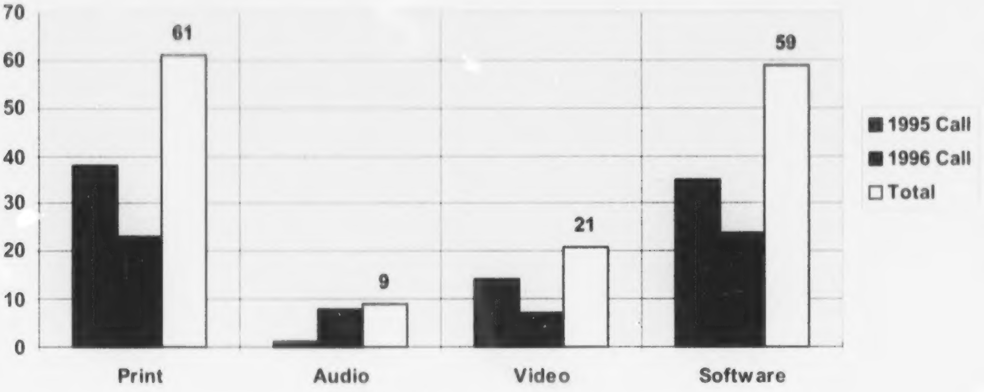
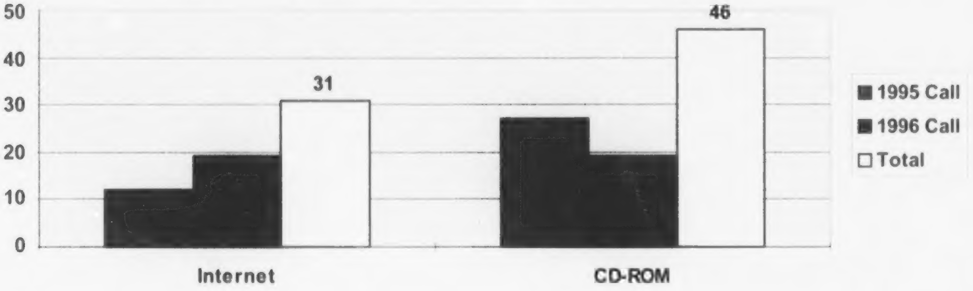


Table 2
1995 and 1996 Calls — On-and-off-line multimedia



increasing the motivation to learn how to learn. Different methodological approaches have been associated with different media used to assist language learning processes over the last 20 years. The use of CD-ROM and the Internet may not be the definitive answer, it may possibly be only yet another fashion. Previous methodological approaches that enjoyed a similar claim for a certain time include grammar translation, direct method, audio-visual methods, communicative and intercultural approaches. They are still alive but are used to a lesser extent than those mentioned above.

ICTs have the potential to facilitate an eclectic approach. However, this very capacity can bring its own problems as attractive packages can be developed and marketed with little thought devoted to the methodological approach and pedagogical content. Language learning and language acquisition especially in the framework of ICTs must be considered in terms of the cognitive and constructivist process involved and the relevant strategies of language processing and production together with strategies of learning that are needed. Particularly in a vocationally oriented framework for language learning, knowledge construction does not simply mean the acquisition of linguistic competence, the development of communicative skills and, even more so, raising learning awareness is equally important.

The following chapter has been contributed by Bernd Rüschoff (5) and outlines some of the theoretical aspects that need to be considered when designing multimedia applications in the context of international language projects (6).

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(5) Bernd Rüschoff is working as Professor of English Language at the Pädagogische Hochschule, Karlsruhe.

(6) A detailed investigation of this issue has just been published in: Rüschoff, B. and Wolff, D., *Fremdsprachenlernen in der Wissengesellschaft: Zum Einsatz der Neuen Technologien in Schule und Unterricht*, Hueber, Munich, 1998.

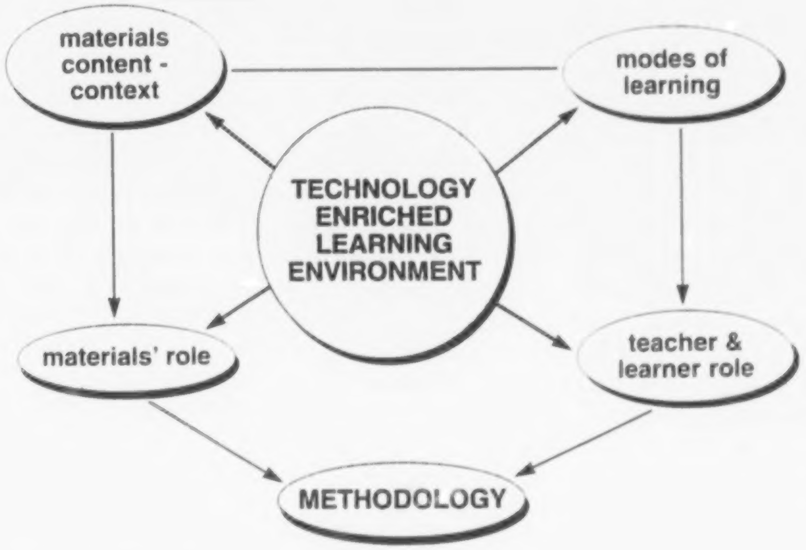
III. Enhancing foreign language training and learning by increasingly using new technologies

1. ICTs, language learning and the information society

Discussing the educational challenge posed by new information and communication technologies, it is often said that we need a radical change in our approaches to teaching and learning in order to prepare future generations best for living and working in the information society. The French philosopher Pierre Levy pointed out for instance that the advent of information technologies would initiate a process of rethinking educational and training procedures, but uses the term 'knowledge society' to describe the outcome of recent technological and social developments. This seems to be logical, because, even though we live in a society in which information becomes more widely available and globally networked and more freely accessible than ever before, information technologies and global access to information are only one aspect of the changing times we live in. Information needs to be processed and translated into knowledge. Therefore, traditional skills of information gathering and storing as well as the mere learning of facts will no longer be sufficient in order to live, work, and learn in the coming centuries. Consequently, the ultimate aim of teaching and learning will be to assist learners in their need to develop strategies of knowledge retrieval, production and dissemination.

It becomes quite clear that we need to rethink some of the strategies and concepts of teaching and learning in terms of enriching classroom activities, reorganising course structures, and providing learners with more autonomous or learner-centred opportunities for learning. New technologies are already playing an important role in this process and can be regarded as an enriching element for the learning environment of the future. All aspects of such an technology-enriched learning environment, however, need to be considered when designing multimedia courseware and resources for language learning.

As the diagram suggests, both the context of use and the content of materials and courseware for language learning need to be considered when discussing technology-enhanced resources. This automatically leads to a careful consideration as to which modes of learning are most relevant within a technology-enhanced learning environment. Right from the start, project teams need to consider (and justify) whether and why such materials are needed and if they are intended for a classroom setting,


materials content - context
modes of learning
TECHNOLOGY ENRICHED LEARNING ENVIRONMENT
materials' role
teacher & learner role
METHODOLOGY

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for self-study, or as part of a telecooperative learning scenario. In addition, the effectiveness of tutorial strategies and navigational procedures integrated into the courseware must be considered. These aspects must be regarded in view of the changing role of (technology-enhanced) materials. The focus should no longer be the development of teaching materials, the terms 'learningware' and learning materials need to be the guiding principle of materials' development, particularly in view of the fact that the core competence of 'learning to learn' is an important issue when discussing pedagogical, teaching and learning concepts for the future.

Furthermore, learner autonomy is one of the key competencies needed in the knowledge society. However, learner autonomy does not imply simple self-access tutorials or individualised learning.

'The new technologies of language learning have tended to latch on to autonomy as one justification for their existence. Computer software for language learning is an example of a technology which claims to promote autonomy simply by offering the possibility of self-study. Such claims are often dubious, because of the limited range of options and roles offered to the learner. Nevertheless, technologies of education in the broadest sense (from the textbook to the computer) can be considered to be either more or less supportive of autonomy' (Benson and Voller 1997: 10).

Learner autonomy is a concept which goes much further than simply 'offering the possibility of self-study', (Holec 1988); technology-enhanced resources can be supportive of autonomy only if learnware or other materials permit the learner to participate proactively in the process of language learning and acquisition and knowledge construction, thus enabling him/her gradually to decide individually upon the materials and strategies of learning best suited to a given aim. And finally, the roles of both learner and teacher need to be newly defined and thought of when designing learnware truly suitable to help learners develop the strategies of knowledge construction mentioned above. Learners need to be regarded as partners in a process of learning not as mere recipients of instruction or tuition in the traditional sense. And teachers must redefine their role as that of an advisor and moderator or facilitator of learning, as has been pointed out repeatedly over the past years.

Furthermore, it must also be assumed that computer tools will facilitate the implementation of such a methodological framework and contribute to solve a large number of practical problems, particularly in the area of exploiting authentic resources. A further important principle to be followed when designing learn-ware is to ensure i. authenticity in learner-software interaction, ii. clear tutorial strategies and iii. easy navigational procedures. After all, authenticity both in content, task, and classroom interaction is 'a crucial issue' in language learning methodology. (Cf. van Lier, 1996: 123) It is therefore argued that new technologies are the perfect aid to assist teachers in their 'need to broaden their scope for creative pedagogical initiatives.' (Little et al., 1989: !) As far as language learning and language acquisition are concerned, these must be regarded as interactive and dynamic processes in the sense that 'studying, learning, reviewing and recalling are not simple input – output activities any more than using language is' (Di Vesta, 1974: 28).

2. Theoretical and methodological background

To continue reflections as to new concepts of foreign language learning methodology with relation to new technologies in what is referred to as a 'post-communicative' era (cf. Wolff, 1994), I should like to present a brief quote from a novel, which as early as 1978 predicted the potential role of new technologies in education in an almost prophetic manner at a time when most educators disregarded the potential role of computers in terms of instructional and tutorial systems:

'People get computers all wrong. They see machines performing huge mathematical tasks. The abacus of the twentieth century. It's about much more than that. Tomorrow's child will tap into the great libraries of the world from his own home. He'll stare into a screen and see history, science, the story of the universe, everything. He'll acquire knowledge at the touch of a button.' (Ian St. James, 1978, p. 376).

This quote is by no means taken from a science-fiction novel or from a campus novel or any kind of educational background. It is, in fact, the statement by a computer engineer in a financial thriller, who has to explain to his companies' board of directors why an investment into computing and IT will be extremely profitable. Even though the text lacks political correctness and is full of uncritical and unreflective enthusiasm as to the advantages of computers for learning, it is underlining one of the key statements of this paper as to the role of new technologies for language learning.

Future generations will need to be given the chance to work and learn more and more by means other than traditional text-books and learning scenarios based solely on classroom tuition. An integrated approach to the exploitation of local and globally networked technology-enhanced resources will become the key to successful education in the 21st century. Such a scenario, in which learners tap into resources and acquire knowledge rather than function as recipients of instruction, comes rather close to cognitive-constructivist approaches to foreign language learning. Such approaches are meeting with growing approval and are regarded by many educational thinkers as a suitable theoretical framework for the learning environment of the future. As far as traditional concepts of computer-based training (CBT) are concerned, such instructivist ideas are not even referred to in the above quote, which might be a coincidence but reflects the line of thinking of a great many of the advocates of an intensive use of electronically published materials in education in general.

As far as foreign language learning is concerned, research into language learning and acquisition processes suggest that mere training in structural (grammatical) and vocabulary knowledge will not result in real linguistic competence and language proficiency. However, apart from basic communicative competences, favoured in the communicative classroom of the 1980s, developing strategies of language processing and learning competence as much as language awareness and skills in knowledge perception, production and knowledge construction is needed for the successful outcome of any language curriculum. Such competences, often discussed in the context of learner autonomy, are of utmost importance for language learning, particularly in a professional context. However, those suggesting a rethinking of a purely communicative methodology (cf. Wolff, 1994) discuss the post-communicative era of foreign language learning (FLL) not in terms of a return to traditional concepts of drill and (kill) practice, quite the contrary. Apart from simply rejecting a traditional instructivist paradigm, the cognitive-constructivist paradigm is seen as an important methodological basis for a real innovation in foreign language learning.

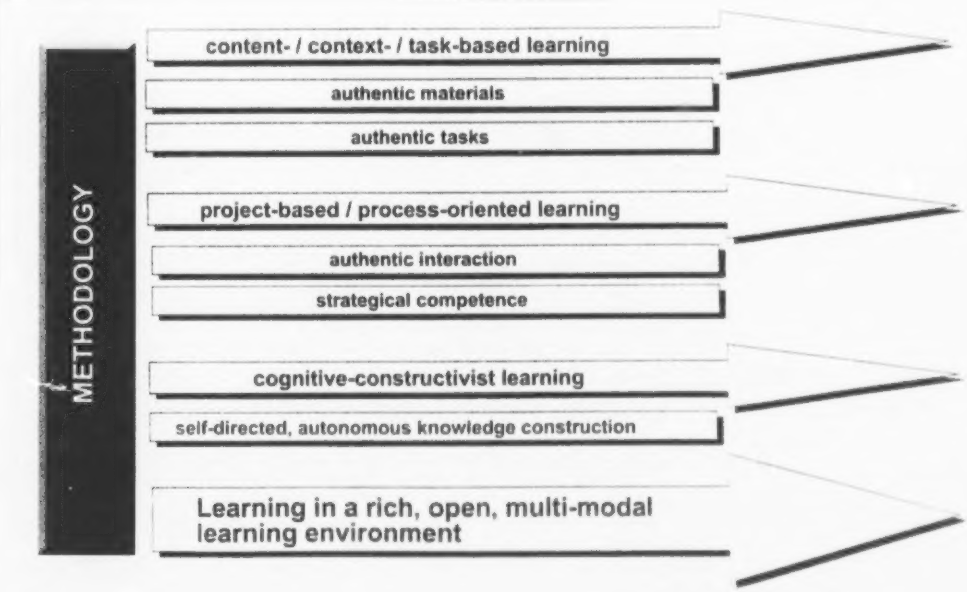
A methodology based on such principles focuses on 'learner orientation, process orientation and learner autonomy' (Wolff, 1994, p. 407), all of which ought to regarded as extremely important in the context of VOLL. Learning should be regarded as a process of information gathering and knowledge processing. In such a process the interaction between knowledge previously acquired and new information gathered leads to the acquisition and even to the production of new knowledge. Language learning should, therefore, be described as an interactive, dynamic process, in which new knowledge is often acquired when learners are placed in a situation where they can explore sources and resources rather than in a context of a mere formal instruction. In such a scenario, learners combine new information with previous factual (declarative) and procedural knowledge and draw new conclusions from this process. Such a process-oriented approach to learning will lead not simply to a better understanding of linguistic facts (e.g. structure and vocabulary) and more effective acquisition of language proficiency; it will also lead to more learning competence and learning awareness. By means of problem-solving tasks, hypothesis formation and validation both the content of learning materials and the learning process itself become more transparent and perceivable. In addition, a constructivist approach puts a lot of emphasis on task-based learning. It has been stated time and again that the best learning results are achieved if learners work as much as possible with authentic and semi-authentic materials which are being put in the context of authentic, real-world-based situations or at least simulations.

As a result, a tools-enhanced approach to the exploitation of new technologies must be regarded as the most promising approach to the integration of such technologies into the language curriculum. The effectiveness of traditional computer assisted tutorials and computer assisted language learning (CALL) teach-ware should be regarded with more scepticism than in the past. Technology-enhanced language learning, however, in the form of using such tools to assist learning processes must be regarded as part of a constructivist scenario of language learning particularly suitable for VOLL. Therefore, it is claimed that the use of technological tools of the real world, such as word processing and data processing as well as electronic publications and so-called cognitive tools will significantly contribute to a successful implementation of these tools into more effective curricula for (vocationally oriented) language learning.

The diagram below summarises the methodological principles discussed so far.

The last item listed in the arrows is of particular importance: all our efforts need to be guided by the desire to provide learners with the opportunity to learn in a rich, open, and multi-modal learning environment. The term multi-modal as opposed to multi-media has been deliberately be used, because this refers back to what has been said about context of use and content of materials as well as to the need to consider carefully the form of delivery of learning materials. An integration of existing forms of delivery and materials with new technologies and multimedia learn-ware is what we should aim for, namely to provide learners with the opportunity to approach a learning task from various angles and experiment with various modes of learning.

As stated earlier, it is felt that the theoretical framework outlined here is not only suitable when it comes to innovation through technology-enhanced language learning (TELL), it is also ideally suited for innovative learning in the context of VOLL. As far as language training for vocational purposes is concerned, two aspects are of particular relevance when discussing the potential of TELL resources. First of all, language proficiency and related competencies as well as all the other skills and levels of linguistic awareness are of utmost importance in VOLL. This is due partly to the restricted time-frame available for VOLL, but even more so to the fact that a great deal of learner autonomy needs to be developed in order to prepare and train professionals for language use in a vocational capacity. This must include not just communicative competencies, but also a much needed ability to handle new foreign language challenges and a capacity to build on existing competence when faced with new job-related developments and constantly changing language materials. Secondly, therefore, the kind of strategies and com-


METHODOLOGY
content- / context- / task-based learning
authentic materials
authentic tasks
project-based / process-oriented learning
authentic interaction
strategical competence
cognitive-constructivist learning
self-directed, autonomous knowledge construction
Learning in a rich, open, multi-modal learning environment

petences discussed above are of particular relevance for the development of language skills for professional applications. The need for lifelong learning, the increased European and international cooperation as well as a growing globalisation of professional tasks and services, not just at management levels but at all levels of professional life, require special skills that enable learners continuously to expand or reactivate existing language competencies.

As a result, TELL resources will not simply facilitate the kind of flexibility in which VOLL curricula need to be organised, as they have to fit in with professional training and/or job-related constraints. Such resources are particularly suited to this kind of language training. Learners do not only work with the kind of materials and tools which occupy an increasingly dominant part of their professional life, thus complying with the requirement of authenticity at the task and content levels in the language learning process. They also learn in the context of project-based and process-oriented learning scenarios, thus facilitating an increase in self-directed forms of learning and learner autonomy.

3. Software and sample resources

Considering what has been said so far, it could be argued that TELL resources should be used only in the form of authentic electronically published materials and cognitive tools (cf. Wolff, 1994). After all, 'effective tools are those that support cognitive processes or allow learners to generate and test hypotheses in meaningful problem-solving tasks.' (Jonassen, 1992, p. 6) Nevertheless, a broader view is needed and positive adaptations of concepts of traditional tutorial software should be considered when discussing TELL resources for VOLL. Obviously, a full description of exemplary software and examples of good practice are beyond the scope of this contribution. However, a few of the key issues and criteria need to be considered by project teams when designing such materials.

The criteria listed below are relevant for multimedia-enhanced learn-ware and authoring tools.

- Such software must permit learners to 'interact' with language data in order to modify acquired linguistic knowledge on the basis of analysis and testing.

- Consequently, such software should not put the learner into the role of the one being tested, but rather facilitate his/her role as an 'experimenter' and researcher.

- Furthermore, control over what the software does or what one wants to do with the software has to be left to the learner to a much higher degree than in most examples to date.

- With regard to language processing, most traditional CALL and TELL exercises so far focus too much on the linguistic aspect of declarative knowledge. In allowing the learner to work with learning materials in different modes, such software should consider procedural knowledge to a much higher degree.

Apart from the benefits authoring software can offer both to teachers and learners, the real contribution to innovation in foreign language learning lies in the tool function of TELL resources. Research has shown that even the use of straightforward word processors can enhance the acquisition of writing and text comprehension and processing skills. This is particularly true when other 'real-world' tools are integrated into word processing packages, such as thesauri, grammar and vocabulary checkers and tools for putting together multimedia and hypertext presentations.

Learning scenarios focusing on project work resulting in electronic dossiers in a hypertext format can greatly enhance strategic (learning) knowledge and competencies in information processing and knowledge construction. Data bases and CD-ROM resources in the form of subject-related or general knowledge encyclopaedia are equally beneficial to the learning process. In addition, software for setting up individual or classroom-related databases, such as classroom dictionaries or curriculum-related encyclopaedia, can be good tools for learners and not only for teachers. Finally, concordant tools as one of the most obvious cognitive tools are perfect for putting learners in a position in which, on the basis of their own research, they can discover forms and structures or patterns of meaning and principles of word formation.

As far as hypermedia are concerned, these are particularly useful concepts for learn-ware which put some of the theoretical aspects discussed in this paper into practice. Here, navigational procedures and the design of user interface, navigational metaphors and assistance in learner orientation need to be considered very carefully. After all, 'the transformation of knowledge... is the litmus test we should use in judging both exploratory and constructive hypertexts.' Such tools engage 'learners in looking at material in new ways...' (Jackson, 1988: 12), thus drawing from and, it is hoped, restructuring and adding to their knowledge base.

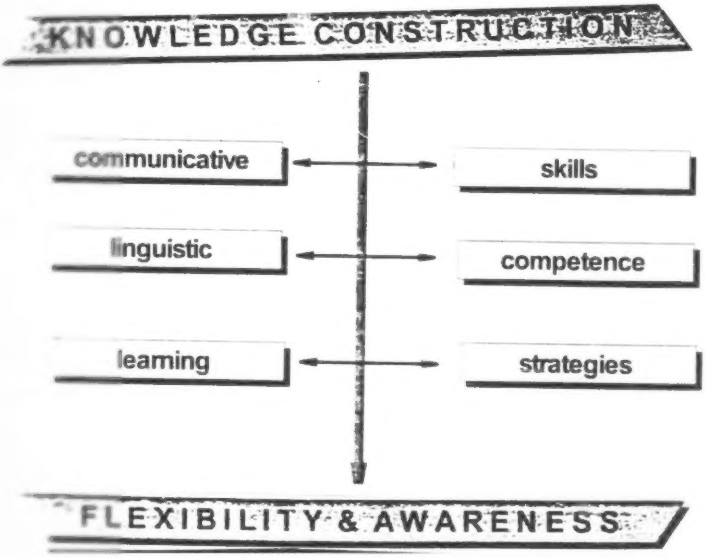
Lastly, telecommunication seems to be developing into the global platform which can be of tremendous help when language learning attempts to go beyond the restrictions of isolated classrooms, thus overcoming some of the limitations of a communicative approach in such a traditional organisation of learning. Access to global information networks, communication with native and non-native peers or tutors, telecooperative project work which transcends the confines of the traditional classroom and the use of telematics in distance learning are just a few of the possibilities which the Internet and the World Wide Web are offering to language learning in general and VOLL in particular.

4. Conclusion

An important feature to be stressed at the end of this paper is the fact that the integration of any technology-enhanced resource into a language curriculum must be firmly based on an 'informatique pédagogique utilitaire' (Pelfrêne, 1986) This means that tools and resources do not confront learners with traditional 'drill and kill' exercises and comprehension tests, but rather with tools to enhance the acquisition of language processing and language production strategies and competencies.

The following aspects should be integrated into the design of technology-enhanced resources.

Knowledge construction with the aim of allowing learners to develop greater flexibility and awareness on communicative, linguistic, and learning levels needs to be part of materials design. In addition, traditional tutorial concepts with a view to developing communicative skills in the traditional sense do not exploit the full potential of new technologies for language learning. Linguistic competence and the acquisition of learning strategies are of equal if not more importance.



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If such systems are well designed or concepts for their application well thought out, the use of new technologies in language learning can provide both teachers and learners with powerful utilities to handle a number of tasks involved in the learning and teaching of a foreign language more effectively: effective not in the sense of simply solving a given task, but in the sense of adding to learning scenarios in which the interactive construction of new knowledge and the acquisition of skills and strategies are of equal importance.

As far as methodological, instructional and pedagogical theory is concerned, the limitations and restrictions of learning scenarios with a purely communicative or instructivist bias have become more evident. This appears to be particularly true in the context of VOLL where the promotion of learner autonomy and aspects of 'learning to learn' are of even greater importance than in foreign language learning in general. In consequence, cognitive constructivist scenarios for language learning, embedded in a post-communicative language classroom focusing on a more authentic form of learning in the context of task-based, project-based and process-oriented learning, appear to be sound pedagogical principles upon which concepts of designing and exploiting any type of technology-enhanced resource for language learning should be based.

In this context, the potential of the hopefully not too brave new world of technology-enhanced language learning may be characterised as follows: powerful tools that are available not just to facilitate task handling but to enable the application and acquisition of increasingly efficient strategies of language processing and language production in a technology-enriched multi-modal 'learning to learn' environment.

IV. Quality assurance and language learning

The following is a short overview of some of the main principles of quality and the set of criteria and indicators which will be applied to a whole range of pedagogical and didactic approaches in different language learning environments and which takes the form of a guide.

There is a current debate as to what is meant and included in the concept of quality assurance when applied to vocational training. Does it concern only context and organisation or does it also include contents and means? Contents, methodology and the learning process are often described as a 'black box' which one should not attempt to open in a quality assurance system.

The *Guide for the evaluation and design of language learning and teaching programmes and materials* (7), promoted under the Leonardo da Vinci programme, on the contrary aims to provide a practical and comprehensive 'toolbox' to support and encourage quality design and evaluation of what goes on in this 'black box'. It aims in particular to:

- raise awareness on the concept of quality in relation to modern language learning and teaching and contribute to the debate in the field;
- serve as an 'exemplary instrument', i.e. a reference or stimulus for publishing companies, materials designers, teachers and trainers, course decision-makers etc. when designing programmes, materials and training courses;
- provide a practical tool for teachers, educationalists and project managers in designing and evaluating programmes and materials and increase motivation in giving a focus to efforts to increase efficiency in the learning/teaching process.

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1. Stages of quality management in the learning/teaching process

A quality management approach to the provision of language learning/teaching programmes and materials can be seen as involving three distinct conscious stages of quality assurance: before (design); during (implementation) and afterwards (outcome). Quality in the design stage will facilitate but cannot guarantee quality at the implementation stage. Quality in implementation can partially compensate for imperfect design but is in effect hamstrung unless it can exploit appropriate content adequately presented. Quality of the service provided by the design and implementation of the programme can be assured only by evaluating whether, independent of subjective impressions, the programme generates reasonable outcomes.

The three stages design, implementation and outcomes are summarised below.

DESIGN (before)
Quality in the design stage relates to the specification of the learning content and activities on the basis of the analysed needs of the learners including the presentation of the content and activities in the programme or materials.

Content refers to the selection of the linguistic content, i.e. functions and notions, grammar, and vocabulary, the kinds of texts and themes to be covered.

Activities comprise the skills, listening, reading, speaking, writing, interacting, mediating, as well as exercises and pedagogic tasks and 'real life' tasks and projects, and the learning strategies.

Organisation at this stage concerns the design of the individual units as well as the curriculum design as a whole; the assessment procedures used to evaluate the achievement of the objectives, and the way the interaction is organised.

Presentation of the material/programme concerns primarily the following aspects navigation, illustrations, layout, and colour and music.

IMPLEMENTATION (during)
Quality in the implementation stage implies providing a positive affective atmosphere and a supportive learning environment in which the realisation of the design is monitored and adapted flexibly to the evolving needs of the learners.

This stage involves: affective management, monitoring activities, and support measures.

Affective management includes steps to ensure that the learning process is an enjoyable, stimulating and rewarding experience. Relevant concepts are framing and centring (e.g. warming up, variable pacing, recuperating), matching (topics and activities to the specific learners), stimulating (the curiosity and creativity of the learners), and encouraging (i.e. challenging as well as praising and rewarding).

Monitoring activities include observation (e.g. of the performance of the individual learner, of the progress of the teaching process), assessment (i.e. achievement in relation to the starting point and/or the time and resources available etc.), feedback (to the learner on language performance), and adjusting provision (e.g. of the presentation or the activities, based on the other monitoring activities).

Support measures include people who can help, if things go wrong (apart from the teacher, i.e. 'tutors', service personnel), information tools (e.g. content overview, reference material), awareness-raising and self-training tools (teachers'/learners' guide, fast track facility to help more independent learners etc.).

OUTCOMES (afterwards)
The quality of the outcomes can be evaluated in terms of the gains in competences and awareness in relation to the resources and conditions concerned and also in terms of the satisfaction of the stakeholders involved.

When evaluating results obtained, one can differentiate between successful learning of the language concerned (success); in-depth evaluation of the means; reactions to the programme/material (satisfaction), and the achievement of broader educational aims (educational bonus).

Success from the learners' point-of-view is evaluated in terms of: internal criteria (progress tests, teacher- and self-assessments), external criteria, comparing pre-course and post-course proficiency, real life competence gains, i.e. improvement in actual real life language use, and depth of acquisition, i.e. long-term acquisition and ability to cope with new tasks.

Evaluation of means: Programme/material should be evaluated by comparing the aims with the realisation in order to give feedback for revision regarding design and implementation.

Satisfaction (compliance with the expectations raised) is measured by evaluating e.g. modalities (duration, sequencing, logistics), facilities (materials, resources, support), activities (tasks, interaction, learning strategies), and progress.

Educational bonus includes such aspects as intercultural awareness, learning strategies, communication strategies, and self-confidence and motivation in the learners.

2. Principles of quality for monitoring the learning/teaching processes

The table below lists nine principles of quality together with related sub-principles.

RELEVANCE	Learner-centredness	personal and professional needs
	Accountability	general educational aims
	Appropriateness	to learning context
TRANSPARENCY	Clarity of aims	objectives, skills, levels
	Clarity about achievement	regarding success and weaknesses
	Clarity of presentation	clear, logical structure
	Clarity of rationale	language learning approach used
RELIABILITY	Consistency	between aims and realisation
	Internal coherence	between parts/units
	Methodological integrity	validated methodological premises
	Linguistic integrity	good current language usage
	Textual integrity	integrity of genre
	Practicality	of exercises, activities
ATTRACTIVENESS	User friendliness	easy to use
	Interactivity	stimulation of response
	Variety	range of activities
	Sensitivity	affective dimension
FLEXIBILITY	Individualisation	regarding learner characteristics
	Adaptability	expansion, reduction etc.
GENERATIVENESS	Transferability	to different learning contexts
	Integration	relating to existing concepts
	Cognitive development	learning strategies and skills training
PARTICIPATION	Involvement	in the learning process
	Personal interest	learners' own opinions and interests
	Partnership	sharing responsibility
EFFICIENCY	Cost-effectiveness	time and resources exploited
	Ergonomy	matching provision to requirements
SOCIALISATION	Social skills	personal growth, cooperation etc.
	Intercultural awareness	of own and other cultures

The approach to quality management taken in the guide is the following:

- definition of users' needs and of goals in terms of quality improvement;
- splitting the teaching and learning process into the three stages: design, implementation, outcomes;
- applying principles and sub-principles of quality to the three stages and their different elements.

3. Quality indicators and profiles

The main outcome are a number of quality indicators and profiles:

The whole process of language learning should be seen as a monitoring cycle, i.e. the results of evaluating the outcomes of one language learning programme should have an impact on the design and the implementation of the next programme.

For each of the three stages design, implementation and outcomes the guide defines aspects of good practice. Quality indicators in the form of questions check what measures have been taken in order to take account of these aspects in the provision of a quality service. The questions are cross-referenced to the principles and sub-principles of quality. The answers given to these questions show the extent to which indicators have been met.

The use of the indicators allows the user to assess significant aspects of any language learning programmes or materials from the design stage through to the evaluation of the outcomes. The table below shows an example of a set of questions related to one aspect of the design stage.

	Principles	Sub-principles
What has been done to ensure that the topics and situations dealt with are relevant and interesting for the learners?	Relevance	Learner-centredness
	Participation	Personal interest
CORE INDICATORS		
Has a formal analysis of needs been conducted for this population as a whole?	Relevance	Learner-centredness
Have the needs of this particular target group been investigated?	Participation	Personal interest
Have the interests of the learners in the particular group been investigated?		
Have the learners completed a questionnaire?		
Have needs and interests been discussed with the group?		
Have the learners been interviewed?		

With the CD-ROM version of the guide it will be possible to produce quality profiles of the learning programme or materials concerned. These profiles will graphically portray strengths and weaknesses in the design, implementation and outcomes. An additional profile will indicate the extent to which each principle of quality is represented and will suggest areas that might benefit from revision in order to further improve the quality of the programme or materials.

Furthermore the CD-ROM version will contain examples of good practice, which will support the user in applying the principles of quality to the language learning programme or materials involved.

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VI. EU-programmes and outcomes of vocational education and training research

Chapter VI gives a summary of **the approaches used in and the findings of various EU programmes and activities concerning vocational education and training**: surveys and analyses projects of the Leonardo da Vinci (LdV) programme of the European Union, the EU's fourth framework programme of research and the work carried out by Cedefop and its network, Ciretoq. Projects launched in 1995 and 1996 in the framework of the Leonardo da Vinci (LdV) programme on the anticipation of qualifications and competences are analysed in detail, and tentative conclusions are drawn up. The remaining articles deal with the opportunities and prospects for 'European' vocational training research, together with its limitations, and – in terms of the more specific support provided by policies – with the tools and methodology of 'scenarios' aimed at facilitating comparative research within the EU.

Marc Ant and Jeff Kintzele have written a comprehensive article for this publication, entitled **'Surveys and analyses projects of the Leonardo da Vinci programme'**. As well as describing the main points, topics, subjects and approaches of the research activities currently being undertaken, it looks at the topic of 'anticipation of qualifications and competences'. The great diversity of topics and approaches discussed, and the methods used, give some idea of the wide variety of findings achieved, or likely to be achieved in the next few years. These findings are mostly highly specific in nature and, as a rule, can be applied only within a certain context and for relatively limited innovations. The effects of these findings and ways of putting them into practice through the implementation of pilot projects in the Member States are also examined.

Burkart Sellin, in a second article on the anticipation of **competencies and qualifications**, summarises the preliminary findings of projects carried out under the Leonardo da Vinci programme, on the anticipation, forecasting or projection of trends and developments concerning qualifications/competencies and employment/occupations, and endeavours to make an initial assessment and to draw some tentative conclusions. This study was carried out by Cedefop in cooperation with the consultancy BBJ (Berlin/Brussels) in the spring of 1998. The projects carried out under the first call for tenders of 1995 had already been concluded, but only a few of those carried out under the second call for tenders of 1996 had achieved any results by that date; a large number of projects were still under way, so this analysis could only be considered as an interim report.

One thing stood out during the course of the study, however, namely the lack of coordination between projects on the same subject; it would have been extremely useful to have had a continuous exchange of information and experience, and closer cooperation between projects, as this would have achieved synergy effects, and thus maximised the benefits of the findings for all the actors, Member States, practitioners and politicians involved. An *ex post* analysis of project clusters would only be worthwhile, in his opinion, if projects were linked by cooperation networks, or at least participated in information exchange programmes.

Michael Kuhn and Erhard Schulte are both closely involved with European projects on research into education and training, including vocational training, on behalf of the Directorate-General for Science, Research and Development of the European Commission. They present an initial overview of experiences with cross-border transnational projects, particularly in the field of vocational education and training research, and put forward proposals on how the **'European dimension' and culture of education and training research, including vocational training,** could be strengthened. For Europe, it was necessary, wherever possible, to introduce a more holistic vocational education and training research concept, and a common research agenda; a new balance between national and regional culture and European identity had to be established. Europe had to abandon comparative research in favour of collaborative research. Cooperation and coordination had to be intensified at all levels. If possible, vocational education and training research should be accepted as a separate research discipline and its interdisciplinary nature particularly emphasised. The authors, inspired by Cedefop's creation of the thematic network (Ciretoq), stress the urgent need to set up thematic cluster groups and institutes within the European Union, and to establish cooperation programmes among them. Transnational and European research, in tandem with cooperation in the field of vocational education and training, could lead to the development of a real 'European society' in the medium term.

Fons van Wieringen presents the **scenario methodology** as a means of analysing trends and potential developments in the field of vocational education, particularly in the increasingly important area of adult education. This methodology had already been used in the past, particularly in the field of sociology, and was now being viewed with increasing interest as a useful tool in the fields of economic policy, labour market policy and vocational education policy, for the purposes of international comparison and trends. To avoid one-sided speculation on what might occur in the future, the author interviewed the experts or stakeholders who were actually participating in the new developments themselves. The questions were grouped according to major trends, which were also divided into subgroups of other trends representing basic conditions for vocational education policy, some of which came as no surprise. The various elements of the scenarios could then be arranged in different ways, depending on the expected (i.e. particularly policy-oriented) basic conditions within a given context. For the purposes of comparison within Europe, this methodology appeared to be particularly suitable as a means of offering alternatives to policy decision-makers and social actors. Cedefop is currently carrying out a research project using this methodology and is hoping to come up with appropriate results by 2000.

A. Surveys and analysis projects of the Leonardo da Vinci programme: quantitative and qualitative analysis of the 1995, 1996 and 1997 calls for proposals with a special attention to projects on 'anticipation of qualifications and competences'

Marc Ant and Jeff Kintzele (¹)

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Summary and outlook

The field of continuing vocational training is on the edge of emerging as an independent scientific discipline, distinct from other fields of research. Vocational training, as a very multidisciplinary and highly complex phenomenon, has evolved over the recent years to an important economic and social factor and is submitted to a high level of public pressure to produce tangible results. This evolution is paralleled on the scientific front, as the number of university chairs and courses, as well as the amount of publications and conferences, has increased dramatically in recent times across Europe.

In this respect, the European Community's former and current vocational training programmes (Eurotecnet, Force, Socrates, Leonardo da Vinci, etc.) have contributed to this evolution while supporting surveys and analysis projects which can be subdivided mainly into the following categories: *ex ante* research, monitoring research, *ex post* research and prospective research.

This tendency is reflected by the surveys and analyses part of the Leonardo da Vinci programme of the European Commission under its III.2.a) Strand. These surveys and analyses projects have as common features the establishment of links between a general context and the specific problem or issue relating directly to the subsequent project leaders. They are generally highly practice and task-orientated and to the broad category action research in order to provide models for decision-makers practical knowledge. Their ambition is also to compare models and to achieve impact, may it be on the European vocational training systems or training practice.

Alongside the 1995, 1996 and 1997 general calls for proposals published by the European Commission, under measure III.2.a), a total of 135 projects were accepted for the three years, with a budget of ECU 20.75 million and representing about 5 to 7 % of the totality of the Leonardo da Vinci programme.

From the qualitative point of view, a great diversity of themes and orientations can be noted. A main characteristic is the development of new issues concerning the anticipation and improvement of skills and qualifications. Furthermore, the factors innovation and training in SMEs, certification, access to training, the needs of disadvantaged target groups and the comparison of training systems in the different countries are also major subjects of research. Also, a great diversity of both quantitative and qualitative research methods can be noted, combining frequently several methodologies, but with a clear preference for qualitative methods.

1. Theoretical aspects

1.1. Surveys and analyses as a scientific undertaking

The question of where research into vocational training presently stands in Europe may be parried simply by paraphrasing St Augustine's famous saying about time: *If you ask us where research into vocational training stands, we know not; but if you ask us not, then we know.*

There is therefore no easy answer, although a number of trends have emerged in recent years, parallel to the development of vocational training as a whole.

However, before we can look in rather greater depth at research trends within the Leonardo da Vinci programme in particular, we should first briefly review the outstanding conceptual difficulties involved.

The first is whether research into vocational training can be said to be an independent scientific discipline, distinct from other fields of research. No question could be more difficult to answer, as the production and dissemination of knowledge and discoveries in this field has not yet led to the emergence of a distinct and sufficiently established identity. This is a consequence of the multidisciplinary nature of initial training, and vocational training in particular, which draws in very diverse ways on a variety of established scientific fields (educational science, psychology, sociology, law, economics, etc.) with no exact delimitation of their respective functions and weighting.

The resulting complexity could also explain why vocational training has so far failed to develop general theoretical principles and bases in support of current practice. But that is partly due to the high level of public pressure on the sector to produce tangible results (in terms of increasing business competitiveness, improving the employability of workers and combating unemployment), so it is not surprising that the emphasis should be on action research rather than basic investigation. Moreover, the continuing vocational training measures implemented in all countries apply a very broad spectrum of methodologies, which again does little to promote the establishment of a new and coherent scientific discipline.

Another factor is the inadequate clarification of the very concepts of training, initial training, continuing training and adult education. Close examination of the definitions in use in the individual Member States reveals that the concepts and their acceptance could scarcely be more varied. What is the difference between adult education and vocational training? How does initial vocational training differ from continuing training? What is the relation between vocational training and educational science or pedagogy? None of these questions could even begin to be answered within a transnational context without lengthy discussion. The use of individual specialist concepts in several languages poses a further fundamental problem: the French concepts *éducation* and *formation* cannot be seen as direct equivalents of the English *education* and *training*, particularly if used in the meaning of the German *Bildung*. These are all issues which the science of vocational training must clarify before it can be considered a coherent discipline.

But that does not mean that nothing is happening in continuing vocational training on the scientific front. It should first be noted that the number of chairs and courses in adult education and vocational training, or adult and vocational pedagogy, has increased dramatically in recent times across Europe. The volume of publications in general and specialist journals and conferences in particular has likewise risen, to the extent that not even the specialists can keep track of research activity in the field.

International institutions, organisations (Unesco, the OECD, the EU) and programmes (Force, Comett, Leonardo da Vinci, etc.) also play an important part through the substantial contribution they make to developing fundamental and applied research and corresponding action in vocational training.

So, although a number of difficulties persist and the definition of research into continuing vocational training as a scientific discipline remains an open issue, it is nevertheless a fact that research strategies and activities are in place in this field, in many cases in response to the European Community's vocational training programmes (Socrates, Leonardo da Vinci, Adapt) and framework programmes for research and development, etc.

Generally speaking, these Europe-wide research activities may be divided into four categories. The first category is what is termed *ex ante* research, which seeks essentially to describe and analyse a given topic or situation and compare various issues at micro- or macro-level, with a view to drawing appropriate policy conclusions and taking the corresponding practical steps. The second is monitoring research, which endeavours, by means of experimental and empirical investigation, generally using action research methods, to exert direct influence on the development of continuing training practices and systems. The third group is *ex post* research, which may be described as assessment and evaluation after the fact.

Nor should the prospective research method be forgotten, its purpose being to draw up plans and hypotheses for future developments. These then serve the policy-makers as tools for defining new frameworks and policy guidelines. The latter method has a more developed conceptual component and, unlike the others, is less geared towards practical goals with direct applications.

Although in that sense the issue of research into vocational training as a scientific discipline is not yet fully resolved, certain conclusions can nonetheless be drawn regarding the methodological principles applied in most of the studies carried out under the Comett, Eurotecnet, Force, Lingua, Petra programmes and now Leonardo da Vinci programme. Clearly, only a brief indication of the basic principles and organisation of surveys and analyses can be given here; further details are available in the relevant specialist literature. We have sought merely to summarise the experience acquired and illustrate it with current examples taken from the Strand III.2.a) under the Leonardo da Vinci programme.

Firstly it may be noted that the research activities, studies, surveys and analyses are all placed from the outset in a specific context and a given problem, issue or theoretical principle drawn from that context is identified for discussion. It is instructive to establish a link between a general context such as industrial change or the introduction of new technologies or working practices, etc. and the specific problem or issue relating directly to the promoter and subsequent project leaders.

Only in the rarest of cases are projects, and surveys and analyses in particular, under the European vocational training programmes designed purely for the purposes of knowledge acquisition or basic research; they are generally highly practice-orientated. In this they are examples of what might also be described as task-orientated or applied research, where the aim is to provide on the one hand models of action for decision-makers in the political, social and economic sphere, and on the other practical knowledge and results which can be used as the basis for the planned product development.

Once the issue is defined, the next stage is to determine the specific topic, the theme and the content. A precise description of the issues to be handled in the course of the research must be given. The difficulty here is in determining the exact content and presenting it in a way that will be understandable to a third person. All too often, highly abstract wording is used, the various components are unrelated and methodology is not distinguished from content. It can aid a straightforward presentation of the subject to give the reasoning behind the project's objectives and working hypotheses and a clear delimitation of content (*What?*) and methodology (*How?*).

These objectives and hypotheses then have to be translated into a series of practical, measurable operational processes which are to be carried out over the course of the project and which give it a distinct structure. At this stage the methodological principles to be applied should also be specified and justified in greater detail. A variety of methodological approaches may be taken, depending on the content defined, and it is helpful at this stage to determine whether an empirical process of data collection or a hermeneutic method of analysing existing textual material in the broadest sense should be applied – action research or the case study method. It is also equally important to be precise in identifying the group or textual sources to be surveyed. However, this is not without its difficulties, since research financed under the European programmes is always transnational, which complicates sampling and data collection procedures. At all events, the sample group must be accurately circumscribed at the outset and its representativeness ensured. It is likewise important to clearly demarcate the project's terms of reference from existing research by means of a thoroughgoing literature search and analysis of the activities conducted under the previous programmes.

The following stage is to put the project hypotheses into effect by means of practical measures to obtain information. The project management aspect is vital, as it stands in direct correlation to the quality of the results achieved. Without excellent project management there can be little hope of producing a high standard of persuasive analysis of the issues, particularly if the use of statistical methods and programs, for example, to assess the data gathered is not specified at the outset. But project management does not relate to content and methodology alone, but also to aspects of managing the project partnership. On this point it is important to note that it is extremely important for the success of the project that the roles and functions of each of the partners involved should be precisely defined from the beginning, and that each should know exactly what action is expected of them, in what circumstances and within what time frame. It can help if one or more partners have expertise relevant to each specific aspect of the research and focus their involvement on a particular area.

Alongside the aspects of management and content, qualitative analysis and evaluation of the project is essential. This includes formulating conclusions and recommendations and producing documents to disseminate and publish the results in various ways. Two points should be made here. Firstly it should be stressed that the various groups of readers targeted must be taken into account in publishing the results. Political, social and economic decision-makers do not have the same reading culture as scientists or continuing training experts, and separate documents geared to the needs of each of these groups must therefore be drawn up. The second point concerns the impact of the research undertaken. The results should not simply be filed away in a drawer; the research should give rise to change whether at policy level or in terms of higher standards in vocational training systems and in corresponding practices in industry, for example. For that it is generally necessary to draw up guidelines on the basis of the results obtained.

Closer analysis of the projects co-financed under the various European vocational training programmes over recent years shows a marked trend in this connection. When the programmes were launched, in the late 1980s, they financed projects to develop new and innovative vocational training methods, methodologies, materials, products and programmes in response to specific needs. Since the start of the 1990s, a new factor has emerged. This is that the projects developed as a whole, particularly research studies, surveys and analyses, have moved from being ad hoc exercises to putting innovative theoretical concepts into practice. But what is innovative about these projects is not that they are developing entirely new products or concepts – what would be termed inventions – but that, from initial idea to result, the full sequence of requisite stages and principles described above is planned and implemented. That is the only way to achieve a degree of control within the project management and ensure that the quality of the research is reflected in the quality of the results, as that is the only way for the projects to bring about change, or in other words for the surveys and analyses to have an impact.

1.2. The question of impact

1.2.1. Starting from diversity

Modesty and realism must always be uppermost when one is asked to comment, half way through a programme, on the impact that measurement or this programme has had, or may have in future.

First a question: what do a Luxembourg butcher, a distinguished French researcher; a German university professor and a European trade unionist have in common? The answer is simple; they all benefit from financing under section III.2.a) of the Leonardo da Vinci programme! They all conduct what is commonly known as a surveys and analyses project. Are they identical? No. Are they comparable? Not really.

Of course, surveys and analyses in the Leonardo da Vinci programme differ widely in their topics, methodological approaches, partnerships and objectives. Is this diversity tenable?

Some people dislike diversity. Especially when it comes to research – a broader concept than surveys and analyses. Some – and not just the idle critics – certainly have their doubts about the foundations and feasibility of such a venture. Of course our own past tends to create a clearly defined – perhaps even static – concept of a study, enquiry or analysis in the research field. The question naturally arises as to whether other concepts might not be equally good.

Diversity is easy to explain; the invitation to make proposals for Leonardo da Vinci is wide open – that is itself a great advantage, even if it does complicate matters – and the programme covers a vast subject area. The heritage of previous programmes must he taken on board and analysis is not the privilege of scientists alone.

Explaining diversity is one thing. Enquiring into its justification is another and far more complex issue. What is more, while diversity is unavoidable at the outset, is it really desirable or, on the contrary, must a choice be made?

Answering that question requires, first and foremost, agreement on the specific character of surveys and analyses in the Leonardo da Vinci programme. Technically, the question of specificity has two dimensions: an operational dimension and a political dimension (political in the broad sense of the term). The operational dimension essentially covers two aspects: firstly, differentiation between the surveys and analyses and the pilot projects and, secondly, the diversity of surveys and analyses models and their scientific justification. The political dimension for its part raises the crucial question of the impact of surveys and analyses. What is their weight and influence. How is that influence exerted?

There will be three strands to our reasoning. Firstly, we will put the question of specificity, specificity from the qualitative angle. Secondly, we will make a brief analyses of the possible approaches and their consequences for surveys and analyses. Finally, we will try to define the exact nature of the impact.

1.2.2. Specificity of surveys and analyses

Studies, surveys and analyses have accompanied all the programmes, with an approach specific to each such programme. What is new at the level of the Leonardo da Vinci programme is a systematisation of this approach. The systematisation is illustrated by measure III.2.a).

The surveys and analyses concept is clear in the sense that it deliberately differs from fundamental research, which is the task of other institutions and programmes. Surveys and analyses tend rather to fit into an applied research logic, situated above or below the level of individual projects as such.

Like many new developments, this surveys and analyses measure still has to find its exact role. Some observers question the concept of specificity on the grounds that a project introduced in III.2.a) may not constitute a surveys and analyses project but rather a straightforward pilot project. That may be the case. But there are plenty of examples to prove the contrary. Some projects introduced under the heading of particular measures should have been qualified as surveys and analyses projects. It would be wrong to dwell at excessive length on the error; especially at the start of the programme when the promoters still have to feel their way, shed old habits acquired in the former programmes and adopt the new programme logic.

In a field as complex as that of vocational training with these many-faceted realities, the surveys and analyses approach is of course necessary, over and above the projects. It is even a safe bet that this approach will become increasingly important in the medium to long term if its succeeds in marking out its own specific character – in other words if surveys and analyses projects make a useful contribution to the debate, provides clarifications and maps out the path to be followed.

1.2.3. Diversity of approaches and shared logics

In broad outline, various standard model approaches can be highlighted in the surveys and analyses under the Leonardo da Vinci programme:

- the academic approach founded on a knowledge accumulation logic;
- the identification of good practices;
- model transfer;
- research action with the determination to create something new;
- critical evaluation.

The academic approach emanates from traditional university research. It is founded broadly on a logic of knowledge accumulation by a researcher who prides himself on his neutrality and scientific objectivity.

The identification of good practices is a more pragmatic approach. It is less scientific in the pure acceptance of the term. The aim here is to identity specific cases and illustrations which can help us to proceed differently, and preferably better.

Model transfer is a still more resolute approach. In this case the aim is to study and, where appropriate, test the application of a different model.

Research-action reflects a desire to create. The researcher goes beyond analysis to influence the progress of events directly. Of course at this level the distinction from a conventional pilot project can become more difficult.

Finally, critical evaluation or analysis is a last important model, although one which is not necessarily the most widely used at present. Critical evaluation remains one of the most useful scientific tools, especially in the social sciences. It may disturb, but its contribution is vital. By way of example, in our own field of occupational training, is it not time for a reappraisal of the evolution of concepts such as training of trainers, need analysis, etc.? Key concepts on which very many initiatives are founded today in all national and supranational programmes – which eat up substantial funds without the outcomes always being convincing.

These different types, combined with widely varying theoretical and technical research foundations make diversity inevitable. Nevertheless, the very conditions of the programme (respect for the criteria of eligibility etc.) introduce a shared dynamic. That being so, the creation of partnerships becomes a major challenge for surveys and analyses. At all events, the dimension of transnationality is vital. For surveys and analyses, the number of participating countries is not the only important factor. Transition from a paradigm of comparison to a paradigm of co-operation is increasingly called for.

We regard the multi-player dimension as still more fundamental. For a surveys and analyses project in Leonardo da Vinci, this dimension can become a major asset. The term multi-player means the reciprocal presence of the scientific and practical environments. Only this type of partnership is essentially able to produce a sound complementarity and give rise to complete partnership networks. A surveys and analyses project must be analytically based (scientific dimension) and supported and founded on professional life (the practical dimension). At the same time, it must induce change.

1.2.4. The problem of impact

At the risk of repeating ourselves, we want to stress that modesty and realism should be the order of the day when it comes to considering impact – without, however, any false modesty. Illusions and vain hopes are all too easily nourished. Everyone who works in the field of education and training is aware of the havoc that can be wrought by these ready-made illusions and solutions ('this is what we will do'; 'this is essential'; 'training solves all problems'). Persons active in education and training are also aware of the importance of the time factor for successful change.

That is the spirit in which we want to set out these brief considerations on impact. We regard several aspects as important, starting from the very concept of impact. The word creates expectations: an impact which cannot be discerned is not perceived as such. However, things are more complex. So it is vital to make a distinction between an impact on daily activities and an impact on systems.

1.2.5. Impact on the system and impact on routine professional reality

The Leonardo da Vinci programme sets out to be a laboratory for innovation in the field of occupational training. By fostering innovation and the search for innovative new solutions, the Leonardo da Vinci programme runs a risk: the risk that not all projects will be taken through to their logical conclusion. However, projects are obviously in a sense challenges. In reality, most projects are responses or tentative responses to situations which have been found to present problems and call for new solutions, e.g. access to training, methods of financing and co-financing in business, participation of SMEs in the training process, etc.

Progress in these fields, which are admittedly not new, but have not yet been fully explored, makes a direct and massive impact on occupational training systems difficult. However, a dynamic may be created in this way and elicit questions within the systems.

The intended impact must therefore be situated at a less comprehensive level. The impact must be sought first and foremost in the field, especially as the temptation is often the reverse for surveys and analyses work. But which researcher has not been confronted with the pitiless shelving of reports in ministerial cupboards – reports which often sought precisely to have an impact on the systems concerned?

That being so, the necessary transnationality of the Leonardo da Vinci programme enables us to break away more readily from the territorial limitations affecting all national systems. We can then adopt a long-term approach (the continuum logic).

1.2.6. Impact and innovation

What is more, there is no automatic relationship between impact and innovation. However, it is at this level that surveys and analyses in all their diversity can prove the most beneficial and induce changes.

To achieve the priority goals of new qualifications, new occupational profiles, better access to training, especially in-service training new routes for integration into the world of work, recognition of qualifications etc., a thorough analysis must be conducted first. We must constantly bear in mind the fact that innovation as such is relative: something which proves highly innovative in one context may already be obsolete in another. Moreover, innovation must also be seen in its evolutionary dimension. It is in this perspective that inspiration must he drawn from innovative practices (which must themselves be traced) and the terrain analysed with a view to the possible transplantation of models that have proved successful elsewhere.

The European dimension of the surveys and analyses may prove decisive in this regard; the transnational detour enables new approaches to be conceived with a view to finding a response to the changes currently taking place. In face of the problems whose origin often (but not systematically) reside at national level, the response which is proposed must be resolutely transnational.

Lastly, the Leonardo da Vinci programme places the emphasis on closer cooperation between universities and business. This dimension is particularly relevant to surveys and analyses. Often a gulf has opened up between university research and the professional world. The emphasis on a multi-player dimension should help to open the debate here.

1.2.7. Actual impact and perceived impact

Of course, the impact will be all the more important if a surveys and analyses project emerges onto a project for a concrete transformation of the existing situation and if it brings about a genuine training strategy.

To draw up genuine training strategies, the point of departure is generally an analysis of the existing situation. For this purpose, monographs or case studies are drawn up in the different partner countries, or questionnaires which will enable field studies to be conducted in companies selected beforehand. At this stage, the needs in terms of new professional skills and the introduction of new techniques and new tools, or in terms of emerging jobs and corresponding training needs, are identified for each of the partners. This is the phase in which exchanges between partners on the various concepts used and on the methodology to be developed appear to be rich and numerous. The lessons drawn from the analysis will then have to be turned to practical use and a joint synthesis arrived at on the basis of the national conclusions.

Impact is achieved less through strident declarations than through modest approaches targeted on precise problems.

We said earlier that we must be both modest and realistic. That being so, we must on no account confuse the actual impact and the perceived impact. The greatest ill from which the Leonardo da Vinci programme, and more generally occupational training as such, is manifestly suffering at present is an image problem. Having regard also to the complexity and diversity of the scope of occupational training, it is immediately apparent that not every actual impact is directly a perceived impact. However, good practices are spreading at European level through the approval or reduction of the experiments conducted. Observation of these innovations is therefore vitally important and surveys and analyses play a key role here.

1.2.8. Back to specifics

To maximise the potential impact of a surveys and analyses project, the combination of a number of factors seems appropriate.

- Complementarity between the scientific approach and roots in the field, i.e. a multi-player partnership promoting an encounter between scientific and occupational circles. This partnership is an earnest of credibility.
- The implication of decision-makers, in the broad sense of the term, from an early stage to take part in the research and discussions. This implication is all the more important as one of the major challenges is increasingly becoming the participation of decision-makers in the process of implementation. The error resides in simply confronting them with results whose purpose and conclusions they fail to perceive. That is often the reason why studies are just filed away.
- Transnational reality, i.e. the transition from a simple logic of observation to a comparative and cooperative logic.
- An obligation to determine problems and elicit concrete actions. Surveys and analyses must be change-oriented. Such studies can usefully be linked in one way or another to pilot projects. It is preferable for them to form part of a resolve to put in hand innovations which may be reflected in the pursuit of subsequent pilot projects.
- Lastly, an effective publication strategy is called for, taking account of the multi-player partnership. In this configuration, a surveys and analyses project cannot be content with a single written document such as a scientific report. Several approaches to dissemination are called for the scientific report and scientific publications, circulation of the principal conclusions in a popularised form and a summary for decision-makers (this exercise looks simple at first sight but is hard to put into practice: writing a readily understandable one-page summary is no easy task).

All of this must then be orchestrated!

1.3. Comparability: a specific feature of surveys and analyses projects

Although the comparative method calls for great prudence and requires an awareness of the risk of oversimplification, it is currently generating renewed interest in the revived study of public policy.

Among the attractions of the comparative method for analysing public policy is the fact that it forces us to question standard classifications and to pose new questions. It thus enables us to make observations on a quasi-experimental basis, which itself imposes a historical, political, administrative and cultural 're-contextualisation' of the policies thus analysed. In this way we are able to interpret differences in the simultaneous enacting of political thinking on similar problems.

A brief citation from a book on public policies serves here to illustrate this point: 'From this point of view, the building of the European Economic Community offers a splendid opportunity for research. It is impossible to think of a more experimental situation: common policies, drawn up in cooperation, to be simultaneously applied in order to reach identical objectives. They are, however, to be introduced into twelve different political and administrative systems, into dissimilar cultures, non-unified legal frameworks, and heterogeneous societies.'

The comparative method is, however, fraught with difficulties. Let us note principally the following problems.

In the first place there is the absence of homogeneous data: the collection and summing-up of data is not carried out in the same manner in all countries and the value of the data is linked to the definitions of the different categories as they appear in national statistics.

In the second place the aggregated data (e.g. national budget, total social security spending) are not very illuminating and may conceal variations within a country or between sectors. Ideally it should always be possible to unravel the various data.

Third, in order to avoid the risk of importing cultural and national political bias into the data, the research should be 'cooperative' so as to take such 'interference' into account. In other words, it should not be characterised by the dominant values of any one national system, but should incorporate all of the different national choices marked by the specific culture and history of each nation.

Referring to the comparative method for looking at public policy does not imply that one is going to limit the analysis proposed to public intervention in the field of continuing vocational training. It has been established that a great number of complex strategies are deployed as a result of the diverse social forces involved. It is true that within the current economic context, the State, business and industry, unions, professional chambers, employer associations, sector-based organisations as well as all employees (potential and actual) are directly concerned by the process of development in continuing vocational training.

It should also be added that the nature of the information gathered calls on us for the greatest modesty as to the finer points of similar research. Very often the reader of the analyses will find questions and hypotheses which only new and more far reaching investigations will be able to test on the basis of fact.

The comparative method in research into continuing vocational training concerned with the comparison of the different national institutions is avowedly very complex, given all the problems posed by a rigorous comparative analysis.

It must be kept in mind that each of the States has a different legal, institutional and cultural approach to the organisation of training and a different employment structure. The specific character of each State is even more marked in its conception of continuing vocational training. The role which each assigns to continuing vocational training in relation to basic or initial education and training also varies considerably. These different approaches have an important impact on the nature and the range of the information available. An understanding of these contextual differences is essential to any comparative study of the data.

Methodologically the two most important questions are how to define the main concepts and how to collect relevant information.

The ideal system for the collection of information could be described as follows:

- methods for the regular collection of data-based on laws and regulations, all the more significant since the collection of information is coercive and strongly influenced by national perceptions of continuing vocational training;
- methods for the relatively regular collection of data outside a legal framework, based on various and highly reliable statistical surveys;
- methods for the collection of irregular and sometimes fragmentary data, which are nevertheless relevant and of considerable value.

Clarification of the concepts, which remains an essential objective can be achieved only within certain limits. Very briefly, for example the definition of continuing vocational training varies from country to country. In certain cases, it will for example include certain kinds of training for staff representatives, and in others not; it may or may not include training for the unemployed, etc.

Consequently, in spite of all the precautions taken, the information collected must be used with great care. The reader should not therefore be surprised that more emphasis is put on the qualitative dimension. Continuing vocational training is approached as a dynamic process which is developing very differently in the Member States and for which one should try to reveal certain key trends which go beyond national variations.

1.4. Some general remarks

It must be borne in mind that the field of vocational training has existed as a scientific discipline in its own right or as a subdivision of a broader discipline for only a very short time, and that the necessary institutions and infrastructure are still being established, and in some cases are still at a very early stage of development. Despite the steady rise in the number of publications and journals in the field and the ever broader scope of conferences and specialist material on methodology and content, a more thoroughgoing definition of the concepts involved, particularly in the perspective of comparison between Europe's national systems and terminology, is lacking, as is a well-developed scientific grounding.

For vocational training is under pressure to supply ever newer solutions at ever greater speed, at a time when unemployment is rising and businesses are feeling the drive towards competitiveness ever more keenly – yet the sector is given neither the time nor the resources to back the proposed measures with scientific evidence and control.

The European Commission's vocational training programmes do offer a way of reconciling scientific rigour and relevance for training practice, however, in that they support research projects designed to develop and test new methods and approaches while incorporating a direct practical reference in their procedures.

The extremely complex issue of content aside, what is essential is the quality of the research and the innovative dimension. The primary concern must be to develop projects which provide for a sequence of well coordinated and methodologically founded stages, stretching from the original idea to the final result, and which are no longer confined to ad hoc investigations of isolated topics.

What is still lacking, however, is a systematic and rather more coordinated development of the scientific community in the vocational training field, especially as regards the formulation of comparative methodologies and the dissemination of research findings in publications. Here the aim must be to step up and systematise cooperation between the specialists across national borders, and thereby ensure that the studies, research projects, surveys and analyses form the basis for appropriate strategies for action, with a view to helping to bring about a substantial improvement in vocational training systems and practices in a European perspective.

2. Surveys and analyses under the Leonardo da Vinci programme: general features

An important stimulus for developing European studies on vocational training is provided by the Leonardo da Vinci programme created by the Council decision of 6 December 1994. This programme foresees, next to pilot projects and placement and exchange programmes, a specific strand (III) to enhance the development of knowledge in the field of vocational training. It is subdivided into Measure III.2.a) for surveys and analyses in the field of vocational training, and Measure III.2.b) for the exchange of comparable data in the sphere of vocational training. The aims of the latter measure are defined as follows:

- the systematic collection of data existing in the Member States;
- the development of comparable concepts on the basis of work done at national level;
- the continuation and consolidation of the Community statistical surveys under way (such as the labour force survey, continuing vocational training survey, etc.);
- the drawing-up of a joint methodological framework which can be used in all Member States.

In the framework of Measure III.2.b), the Commission has adopted a ten-point programme (1997), the implementation of which is ensured by a committee of experts: 'Statistics in the field of education and training'. In 1995 a call for tender led to three studies on initial training, on continuing training and on transition to working life respectively, and to a study carried out by Cedefop on comparable classification. In 1996 three themes were included in a specific call for tender on the supply of training, the learning of languages, comparable classifications and literacy for adults.

The orientations defined in the Council decision under Measure III.2.a) for surveys and analyses projects are mainly to be seen in the following fields:

- skill and qualification needs, by setting up general arrangements for anticipating such needs at the appropriate level;

- the development of vocational qualifications, by clarifying the terminology used in the Member States and by promoting the transparency and understanding of vocational qualifications, in cooperation with Cedefop;
- improvement of the attractiveness of, and parity of, esteem for initial vocational training;
- developments in the diversification of initial and continuing vocational training;
- new types of vocational training apprenticeship or sandwich courses involving undertakings and training bodies and/or universities;
- new training methods for SMEs in order to increase access for their workers to appropriate training;
- undertakings' continuing vocational training plans, within the framework of sectoral surveys;
- new forms of training for vocational training planners and managers;
- new methods and tools for evaluating the quality and cost-benefit analysis of vocational training for undertakings and workers;
- the accounting of vocational training expenditure, especially from the point of view of investment in training;
- the development of vocational training contracts between employers and employees or their representatives, including contracts at undertaking level;
- the development of access to training, e.g. through incentives, rights or special financial resources;
- the recognition of the skills acquired in training measures.

3. Results of the calls for proposals 1995, 1996 and 1997: an overview

At present, it is premature to identify definitive results of the surveys and analyses projects from the calls for proposals 1995–97 as not all of the projects have produced their final results. Nevertheless, on the basis of the descriptions of the submitted projects and the first available interim and final reports, a few conclusions can be drawn in the light of the orientations chosen by the project promoters. Therefore, in order to highlight the topics and contexts defined in the framework of the different projects, we have analysed the model descriptions of the projects and reproduced their specific features in the following Table 1. The classification of all the surveys and analyses projects from the three different calls 1995, 1996 and 1997 is meant to facilitate the identification of trends and differences between the calls. Thus, the items in the ranges indicate the main contents, the columns the main methods and contexts. This analyses is inspired from 'factors analyses', but represents a more simple approach in order to provide a first overview of the projects.

For the 1995 call for proposals, it can be said that on the basis of the chosen topics, the overwhelming majority of surveys and analyses deal with the development of ***new methods for assessing qualification and skills needs***, as can be seen from Table 1. These surveys in particular tend to take a sectoral approach and are generally set up as comparative studies between a selected number of countries and also often include case studies. Other themes are the adjustment of training systems, development and assessment of new training methods, finance models, cost-benefit analyses and the development of innovative models.

The major difference between the 1995 and the 1996 call is that there was no longer such a strong focus on anticipation of qualification and training needs, but instead a much larger distribution between the various fields of research interest. This strong emphasis on anticipation in 1995 is certainly the expression of a subsequent and corresponding need, but must also be attributed to the fact that the priorities defined for this call also strongly highlighted this area. Another major difference between the first two calls for proposals under the surveys and analyses measure is that in 1996 a significant number of projects feature research aspects in the field of analysis and improvement of the learning process, and most important of all, are to a much larger extent than in 1995 oriented towards the labour market. The themes of the projects in 1996 are more job-related and also deal more with the issue of transition from school to work or the social and professional integration of disadvantaged tar-

Table 1: Distribution of chosen research topics for the 1995, 1996 and 1997 Surveys and analyses projects

	1995 1996 1997	Sectoral approach	Learning methods/ media	Target group orientation	Comparative studies	SME issues	Regional approach	Total
Competence and training needs analyses	1995	17	1	3	4	1		26
	1996	4		1		1	1	7
	1997	7	1	4	4	2	3	21
Adaptation of training systems	1995	4		1		1	1	7
	1996	3			3			6
	1997	2	1	2	1		2	8
Evaluation of new methodological approaches	1995			1		2		3
	1996				1			1
	1997	1	3		2		1	7
Financing models Cost-benefit-analyses	1995		1		2	3		6
	1996	1			1	1		3
	1997		1					1
Certification	1995					2		2
	1996							
	1997	2						2
Promotion of innovation capacity	1995					2		2
	1996		2		1		2	5
	1997	1	1		1	1		4
Social exclusion	1995				1			1
	1996		3	2				5
	1997				1			1
New learning process	1995							
	1996	2						2
	1997							
Transition from school to work	1995							
	1996		1	2	1			4
	1997							
New areas of employment/occupational profiles	1995							
	1996	3	1	3			1	8
	1997	1			1		1	3
TOTAL	1995	21	2	5	9	9	1	47
	1996	13	7	8	7	2	4	41
	1997	14	7	6	10	3	7	47

get groups. That is why that they also deal indirectly with new strategies for implementing vocational guidance and counselling methods and training of personnel for these purposes.

Apart from this, however, no further significant difference between the 1995 and 1996 calls for proposals can be identified. The projects have either an explicit ***sectoral approach*** which means that they try to develop solutions for specific problems encountered especially in one specific sector, or they adapt an approach which is not specific to a sector, and therefore more general and probably also more technical from the pedagogical point of view. Concerning the methodologies applied, of course, as suggested by the definition of the surveys and analyses measure, projects tend to follow the principles of action research, meaning that their methodologies and results are directly aimed at influencing the decision and policy-making processes. Furthermore, they mostly are based on a comparative perspective to analyse the situation between a number of different countries in order to draw conclusions to improve the existing situation on a European scale. Besides the fact that many surveys and analyses are using empirical research instruments, they often provide an analysis in greater depth of a limited number of case studies in order to identify models of good practice which are likely to be transferable to other European Member States and contexts.

The 1997 call for proposals is again more centred on competence and training needs analyses, adaptation of training systems remaining an important topic and evaluation of new methodological approaches becoming a significant issue. Sectoral approaches and comparative studies remain important. A new trend towards more regional approaches can also be noticed. Learning methods and media as well as target group orientation remain additional noticeable trends.

4. Quantitative results of the calls for proposals 1995, 1996 and 1997

4.1. Statistical data

Table 2: Distribution of submitted and accepted surveys and analyses projects in 1995–97, Total budget and surveys and analyses budget 1995–97

	1995			
Number of projects	**submitted**	**accepted**	**%h**	**%v**
Total	4 656	749	16.1	
Procedure 1	2 486	319	12.8	42.6
Procedure 2	2 170	430	19.8	57.4
Total budget (ECU million)		89.66		
Surveys and analyses	383	47	12.3	6.3
Budget for surveys and analyses (ECU million)		6.85		7.6

	1996			
Number of projects	**submitted**	**accepted**	**%h**	**%v**
Total	3 113	793	25.5	
Procedure 1	1 503	299	19.9	37.7
Procedure 2	1 610	494	30.7	62.3
Total budget (ECU million)		112.14		
Surveys and analyses	223	41	18.4	5.2
Budget for surveys and analyses (ECU million)		6.03		5.4

	1997			
Number of projects	**submitted**	**accepted**	**%h**	**%v**
Total	1 981	730	36.9	
Procedure 1	990	292	29.5	40.0
Procedure 2	991	438	44.3	60.0
Total budget (ECU million)		107.76		
Surveys and analyses	147	47	32.0	6.4
Budget for surveys and analyses (ECU million)		7.87		7.3

%h = percentage of accepted among submitted projects

%v = percentage of projects among total accepted projects

Table 3: Distribution of submitted and accepted surveys and analyses projects 1995-1997 per country

1995	A	B	DK	D	E	EL	EU	F	FIN	FL	I	IRL	IS	L	N	NL	P	S	UK	Total
Submitted	8	14	4	32	47	25	4	49	3	0	48	7	1	3	1	3	74	17	43	383
Accepted	2	3	1	4	5	4	0	7	2	0	5	1	0	2	1	0	3	1	6	47
1996	A	B	DK	D	E	EL	EU	F	FIN	FL	I	IRL	IS	L	N	NL	P	S	UK	Total
Submitted	2	17	4	11	27	21	3	23	9	1	48	5	0	2	0	6	16	4	24	223
Accepted	1	0	1	4	3	2	3	5	0	0	10	2	0	0	0	3	1	0	6	41
1997	A	B	DK	D	E	EL	EU	F	FIN	FL	I	IRL	IS	L	N	NL	P	S	UK	Total
Submitted	5	4	0	11	20	8	7	10	2	1	28	3	1	1	5	9	7	6	19	147
Accepted	2	2	0	4	5	2	5	3	0	0	7	2	1	1	1	3	0	0	9	47

Table 4: Distribution of accepted surveys and analyses per type of organisation (contractor)

	PME	GE	GRE	OE	ATS	OP	OF	U	AUEF	CR	OST	CC	OPR	OQ	PP	EUR	O	REC	O
1995	4		2		1		6	5	2	1	1		3				4		11
1996	1					1	5	4	1			1	3		2	1	5	16	1
1997	2		2		3	1	5	11	4				1		1	3	3	11	
Total	7		4		4	2	16	20	7	1	1	1	7		3	4	12	27	12

PME	– small and medium-sized enterprise	CR	– regional consortium
GE	– large enterprise	OST	– sectoral organisation
GRE	– group or association of companies	CC	– chamber of commerce, industry, agriculture
OE	– employer organisation	OPR	– professional organisation/federation/grouping
ATS	– trade union organisation	OQ	– organisation concerned with certification and recognition of qualifications
OP	– joint body	PP	– public authority
OF	– training organisation	EUR	– European organisation
U	– university	REC	– research centre or institute
AUEF	– university enterprise training partnership	O	– other organisation

Table 5: Distribution of submitted and accepted surveys and analyses per priority, 1996 and 1997 (1995 not available)

Priority	1996		1997	
	submitted	accepted	submitted	accepted
1	70	12	60	16
2	24	2	27	7
3	39	10	20	7
4	60	14	31	15
5	27	3	12	2
?	3			
Total	223	41	147	47

1 – acquisition of new skills
2 – forging closer links between educational and training establishments and enterprises
3 – combating exclusion
4 – promotion of investment in human resources
5 – promoting access to skills through the information society in the context of lifelong learning
? – no clear allocation to any of the above priorities

Table 6: Distribution per theme, Calls 1995 and 1996 (1997 not yet available)

Themes	**Number of projects**
Adaptation to industrial change	2
University/company cooperation	1
Self-training	2
Relationship between training and research	19
Social dialogue	1
Vocational qualifications	7
Apprenticeship	2
Access to vocational training	6
Training within companies	1
Training as a sectoral dynamic	6

1996

First theme	**Number of projects**
Access to vocational training	1
Disadvantaged people	2
Equal opportunities	3
Forecasting training needs	3
Industrial change	2
Investment in training by enterprises	5
Local development	1
New job profiles	4
Regional development	2
Relationship training – work organisation	1
Self-training and ODL	2
Social dialogue	4
Training in SMEs	1
Transition/integration of young people into work	1
Vocational qualifications	5
Vocational/careers guidance	4
Second theme	
Access to vocational training	2
Disadvantaged people	2
Equal opportunities	1
Forecasting training needs	4
Relationship training – work organisation	1
Sectoral development	1
Self-training and ODL	1
Social exclusion	4
Training in SMEs	1
Transition/integration of young people into work	1
Vocational qualifications	3
Third theme	
Disadvantaged people	4
Evaluation of vocational training	1
Investment in training by enterprises	1
Regional development	1
Sectoral development	1
Social dialogue	2
Training in SMEs	3
Vocational/careers	1

Table 7: Distribution per product, Calls 1995 and 1996 (1997 not yet available)

1995

First product	**Number of projects**
Conversion of training needs into objectives	4
Creation of networks	2
Curriculum programmes	1
Distance training tools	6
Individualised training with tutor support	1
Management tools for transnational placements	1
Methodologies for vocational guidance	9
New occupational profiles	2
Publications	17
Seminars/training of trainers	1
Training programmes	2
Second product	
Conversion of training needs into objectives	7
Creation of networks	5
Curriculum programmes	2
Distance training tools	2
Individualised training with tutor support	1
Management tools for transnational placements	1
Methodologies for analysing training needs	7
Publications	5
Seminars/training of trainers	1
Training programmes	2

Third product	
Curriculum programmes	3
Distance training tools	3
Publications	4
Conversion of training needs into objectives	1
Self-learning materials	1
Curriculum programmes	2
Seminars/training of trainers	1
Databases	1
Methodologies for vocational guidance	3
Management tools for transnational placements	1

1996

First product	**Number of projects**
Evaluation tools	1
Methodologies for analysing needs	2
Publication	38
Training networks and consortia	1
Second product	
Alternance-based training	5
Book, manual, guide	1
Evaluation tools	2
Group training with tutor	1
Methodologies for forecasting training needs	1
Semi-autonomous/flexible training	1
Systems for language audits	1
Third product	
Alternance-based training	1
Book, manual, guide	3
Computer/electronic-based materials	1
Distance training	1
Evaluation tools	1
Tutorship	4

Table 8: Distribution per target-group, calls 1995 and 1996 (1997 not yet available)

1995

Target-group No 1	**Number of projects**
Disadvantaged	6
Socioeconomic actors	4
Workers/employees	14
Young people in training	2
Managers	1
Young people entering work	4
Companies	8
Trainers	8
Target-group No 2	
Companies	9
Policy makers	2
Trade union representatives	1
Women	1
Disadvantaged	2
Managers/owners of companies	2
Socioeconomic actors	3
Young people in training	3
Workers/employees	3
Young people entering work	8
Trainers	2
Target-group No 3	
Companies	2
Planners	1
Policy makers	1
Socioeconomic actors	1
Trade union representatives	1
Trainers	2
Women	1
Workers/employees	4
Young people entering work	3
Young people in training	4

1996

Target-group No 1	**Number of projects**
Disadvantaged groups	3
Managers/owners of SMEs	4
Migrant workers	1
Older workers (above 50)	1
Representatives of sectoral organisations	2
Supervisors, managers/directors of HR	1
The less qualified	1
The unemployed	1
Trade union or worker representatives	1
Trainers, designers and management of training programmes	4
Vocational training policy-makers/ decision-makers	16

Vocational training policy-makers/ decision-makers	1
Workers in companies	2
Young graduates	1
Young people in initial vocational training	3
Target-group No 2	
Disadvantaged groups	3
Human resources experts (in U, OF)	1
Managers/owners of SMEs	1
Planners at regional level	2
Representatives of employers' groups	1
Social workers	1
Students	1
Supervisors, managers/directors of HR	3
The unemployed	1
Trade union or worker representatives	4
Trainers, designers and management of training programmes	5
Training experts (in U, OF)	5
Training managers	2
Vocational training policy-makers/ decision-makers	6
Workers in companies	1
Young workers	1
Target-group No 3	
Disadvantaged groups	1
Managers/owners of SMEs	4
Planners at regional level	4
Representatives of employers' groups	2
Social workers	1
Supervisors, managers/directors of HR	2
The less qualified	1
The unemployed	1
Trade union or worker representatives	1
Trainers, designers and management of training programmes	7
Training experts (in U, OF)	1
Training managers	1
Vocational training policy-makers/ decision-makers	4

4.2. Analyses of data

Under the first three calls for proposals under Measure III.2.a), a total of 753 surveys and analyses projects were submitted and 135 projects were accepted for the 1995, 1996 and 1997 calls (see Table 2). A total of 9 750 projects were submitted and 2 272 projects were accepted for all measures. The total budget for all projects amounted to about ECU 310 million and ECU 20.75 million for the surveys and analyses projects, equalling about 5 to 7 % of the total budget for the three years (6.3 % in 1995, 5.2 % in 1996, 7.3 % in 1997). Table 2 shows that 12.3 % of the total number of surveys and analyses projects submitted in 1995 were accepted, with 18.4 % in 1996 and 32.0 % in 1997.

Furthermore, there has been a very sharp fall in the number of projects submitted, both in terms of the total number, which fell from 4 656 in 1995 to 1 981 in 1997, and in terms of the number of surveys and analyses, which fell from 383 in 1995 to 147 in 1997. By contrast, the number of projects accepted, both in overall terms and for surveys and analyses, has remained constant. This of course explains the spectacular increase in the percentage of approved projects. This percentage rose from 16.1 % to 36.9 % for projects as a whole, and from 12.3 % to 32.0 % for surveys and analyses. Furthermore, the percentage of surveys and analyses out of the total number of projects has remained constant, as would be expected. Political decision-makers and Leonardo administrators will need to study this drop in the number of applications, which may be explained by the very real improvement in the projects submitted but other factors may also be involved.

Table 3 contains the breakdown of projects by country. It shows that it is Germany, Spain, France, Italy, Portugal and the United Kingdom which have submitted the highest number of projects. Furthermore, we note a fairly widespread fall in the number of projects submitted by country. This drop is particularly spectacular for Portugal, where the number of projects submitted fell from 74 to 7.

The distribution of projects by type of contracting organisation (Table 4) points to a predominance of training organisations, universities and research centres, which together represent around half of the projects.

The distribution by priority (Table 5) shows inequalities between the five items. In 1996, only two priority 2 projects (forging closer links between educational and training establishments and enterprises) and three priority 5 projects (promoting access to skills through the information society in the context of lifelong learning) were approved. In 1997, again only two priority 5 projects received funding.

Concerning the themes listed in Table 6 (those indicated by the promoters – not to be confused with the themes in our typology under point 5.1), we note that in 1995 it was the relationship between training and research which was the most popular theme (40 % of projects). In 1996, the themes were much more varied, and do not allow any other conclusions to be drawn.

The products indicated by the promoters are listed in Table 7. We see that in 1995, publications were the most important product. In 1996, this trend was further strengthened, with 90 % of projects indicating this as the primary product.

Table 8 shows the target groups indicated by order of priority. In 1995, the target groups were mainly employees, firms, trainers and disadvantaged people. By contrast, in 1996, the primary target group cited was decision-makers.

5. Qualitative results

It is impossible to describe in just a few pages the wealth and diversity of themes covered by the surveys and analyses for the 1995, 1996 and 1997 calls for proposals. Indeed the selected projects demonstrate a wide variety of contents, methods, results and impacts. Furthermore, it is too early to attempt to define the results precisely, given that the 1996 projects began work only in July 1997, and 1995 projects were due to yield their final results only at the beginning of 1998 at the earliest. Project promoters have submitted their reports on the first phase which consists mainly of developing the methodological tools.

Nevertheless, based on the descriptions of the projects submitted, it is possible to establish a brief but representative typology of the main subjects tackled over the three years, as well as the principal methodologies used. We develop the main thrust of each of these major themes and provide representative examples. It goes without saying that the subjects of the surveys and analyses submitted are not mutually exclusive, since a single project can sometimes cover several of the themes mentioned.

The qualitative analysis of the three years of surveys and analyses was based on a systematic analysis of all of the projects selected by the Commission (²). A data sheet was drawn up for each project describing in a few words the theme, method, results and impact. Based on a systematic rereading of the data sheets, the main themes were gradually sorted into groups. After the typology was finalised, a final reading was made to ensure that nothing significant in the content had been overlooked. Several examples were chosen as being representative of each of the typology themes. It was of course not possible to include the less common subjects in the typology in order to retain its role as a synthesis. The same approach was used for the methodologies. The principal methods implemented are listed more briefly. A fuller analysis of the methods, results and impact will form the subject of a more comprehensive document at a later date.

5.1. Main themes of the surveys and analyses

5.1.1. Improving skills and qualifications

The acquisition of new skills and the improvement of existing ones, which are priorities of the Leonardo programme, are covered by a large number of projects. This is the theme most frequently studied. The aim of many projects is to determine the new skills required by technological change and to propose viable solutions within the context of the relatively

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(²) European Commission, *Leonardo da Vinci – Compendium: 1995 Projects*, Office for Official Publications of the European Communities, Luxembourg, 1996; European Commission, *Leonardo da Vinci – Compendium: 1996 Projects*, Office for Official Publications of the European Communities, Luxembourg, 1997. The 1997 edition is under preparation and will be published during the course of 1998. Original projects were used for this analysis.

new concept of lifelong learning. For example one project studies future skills requirements in the publishing and electronic media industry. The results of the study will help the education authorities, business firms and national partners to develop suitable training strategies and distance training modules which will later form the basis of a transnational vocational training programme for the publishing industry.

Creativity and an innovative spirit in the workplace, together with the use of new technologies, are foundations for the success of an enterprise. This new approach also calls for a re-examination of the concept of core skills, which are defined in different ways depending on the country and culture. One project aims to construct an instrument which will lead to a better understanding of core skills at transnational level. The partners are studying good practices which are likely to encourage individuals to acquire skills and allow such skills to be integrated into the production process.

Another project, which makes explicit reference to social dialogue, sets out to analyse the new qualifications required for trade union representatives in the field of teleworking. Indeed, the integration of electronics into production, particularly teleworking techniques, enables work processes to be linked by removing the obstacles associated with distance. The new qualifications acquired by trade union representatives will enable them to participate effectively in the European debate which has begun on this subject.

A number of studies concern the skills and qualifications of people living in marginalised or rural regions. One project studies the potential needs of the inhabitants and SMEs of European rural areas for understanding and being able to use new information technologies. If the local economy does not generate any need for this, alternative means of stimulating interest in the new technologies will need to be found.

Some studies deal with new skills and occupational profiles required by current changes in society. The environment and all of its related problems are high on the agenda in Europe today. However, training for environmental experts varies from country to country. One project develops a common framework for understanding such differences and similarities, in order to show what development possibilities exist for the creation of a transnational qualification for environmental engineers. The occupational profile of company training instructors is the subject of another surveys and analyses project.

Cultural heritage is also a vehicle for the creation of new occupational profiles. One project sets out to determine and evaluate the job-creation potential of this heritage, which is at the same time a potential tourist attraction. The studies are being carried out in three countries and cover regions which are similar in terms of economic restructuring and tourism possibilities. The partners are establishing the new occupational profiles, as well as the basic skills required for improving access to historic sites, services to visitors and maintenance tasks. Another project, working in the same field, studies the skills requirements for museum personnel.

5.1.2. Evaluating and improving the cost-benefit ratio of training measures

These projects estimate the cost of training courses in relation to the return on investment, in order to develop measures which are both effective from a training standpoint and advantageous from a financial standpoint. One possibility for avoiding financial problems with training is the use of new technologies such as computer-assisted training. One study examines the experiments which have been carried out in this field, plans an empirical study of computer-assisted training courses in business firms and prepares a handbook of good practice in this field. Based on these analyses, a more rigorous definition of future concepts in this sector is possible.

Another project aims to measure the financial return on investment of training within the road transport sector in six European countries. It also makes it possible to verify whether the method used is applicable to other sectors of the European economy. This project includes an analysis of a representative sample of business firms and an in-depth analysis of employees. Based on an econometric model, the statistical relationship between the training effort deployed and the results for the enterprise are established.

Another project aims to develop a transnational model for the cost-benefit analysis of in-company training, encompassing both the descriptive aspects (such as the subjective considerations of return on investment which are involved when business firms take decisions regarding training) and prescriptive aspects (objective considerations of return on investment, for example). This model will help business firms to determine the viability of training programmes.

The importance of access to training for financially disadvantaged or geographically isolated people is a concern for many projects. Such training must, for example, be provided at the workplace and not only in specialised training centres. From this standpoint, one project studies the quality and cost-benefit ratio of the training modules currently available on the market. It sets out to ascertain to what degree these modules match demand from employers and employees. At the end of the study it will be possible to make recommendations concerning training courses for which employees are not obliged to leave their workplace.

5.1.3. Promoting innovation and training in SMEs

By their very nature, SMEs encounter serious problems when they attempt to define their needs for training and adapting their workforce. They have difficulty in taking advantage of the training opportunities on offer, and new strategies therefore need to be devised and developed. For instance one project studies how SMEs in 12 European countries tackle their training needs. After identifying problems and good practices, the study will make recommendations for improving training strategies and programmes aimed at SMEs.

Another project analyses the economic impact of the different training types and systems used by SMEs. This survey studies the respective costs and benefits of traditional training methods compared with open and flexible training methods, including the use of telematics. The aim is to make recommendations about the relevance and effectiveness of the methods used.

A third project embarks on an analysis of the training needs of SMEs in the tourism sector – a growing sector in which they are particularly well represented. Rapid labour turnover in this field requires a special effort to be made with continuing vocational training in order to provide a pool of qualified personnel. Due to rising competition in the tourism sector, skilled personnel also represent an important factor of competitiveness. In spite of these changes, the level of interest among SMEs for such training is not yet very marked. This project will highlight the factors that dampen or encourage an interest in continuing training in this sector.

As guidance and counselling services for SMEs are becoming crucial for the future, the aim of one project is to identify the policies, programmes and tools which make it possible to increase the ability of SMEs to innovate and teach themselves. A needs analysis is being carried out and a series of criteria defining the skills required in the field of counselling and assistance services for SMEs is being established.

5.1.4. Improving and developing skills certification

An important theme of some of the selected projects is the validation, certification and accreditation of qualifications. In the retail sector, for example, one project proposes to carry out a feasibility study of the creation of an observatory for qualifications and employment in this sector. Another project provides for the creation of a computerised catalogue of best practices in the field of vocational training certification.

One study concerns vocational qualifications in the health sector of Member States. The transparency and comprehensibility of such qualifications are proving to be increasingly important if we wish to foster worker mobility in this sector and reduce existing barriers between Member States. The aim of the survey is to analyse systems of vocational qualifications and methods of initial and continuing training in order to draw up a handbook to facilitate the comparison of qualifications in the health field.

One interesting point is the certification of skills acquired through work experience, other than compulsory school-based teaching or the need for continuing training outside the workplace. One project aims to set up a European mechanism for the accreditation of prior learning through work experience and thereby facilitate lifelong learning. This allows the link between initial and continuing training to be harmonised by taking periods of work into account. The analysis is carried out on the basis of existing studies concerning the accreditation of prior work experience in the Member States involved in the project. It carries out field surveys among the various players concerned by the accreditation of prior skills.

5.1.5. Enhancing the status of initial vocational training

These projects aim to improve the appeal, brand image and equivalence of initial vocational training compared with general education. For instance, one project analyses the definition of national policies and practices relating to initial vocational training in five Member States, in order to determine how to improve the status and appeal of these study courses. The project sets out to identify good practice in the various countries and to formulate recommendations for the partner countries in order to improve the status of initial vocational training.

Over the past 10 years or so, a number of educational reforms have been carried out in Europe to attempt to find innovative links between general education and vocational training, as well as between school-based training and practical work-based training. These programmes mainly concern upper secondary education. One Leonardo project makes a comparative study of the work which has been carried out at national level concerning the results of such programmes. The study should lead to new ideas on enhancing the status of initial training when the results are pooled.

5.1.6. Guaranteeing access to training for all

Access to training for all (apart from disadvantaged target groups and women, which are studied under two separate points below) is one of the constant concerns of the Leonardo programme, and a number of projects have studied the subject. However, it should be noted that few projects are devoted to access to training for the general public, with most studies of this type being aimed at disadvantaged target groups or women.

Self-employed workers represent an occupational group which must be guaranteed access to training in order to enable them to adapt to technological and social change. In fact this is an extremely heterogeneous population. One project studies the composition of a group of self-employed workers in the craft, education and transport sectors, as well as the legal framework in the various countries concerned by the study. The aim is to identify obstacles to access to training for self-employed workers and to make recommendations for removing them.

Since the 1980s, a large number of workers aged over 45 have gradually been ousted from the labour market because they are considered to be incapable of adapting to the pace and nature of industrial change. One project sets out to help identify new political and social solutions to the problems posed by this category of the population, by basing itself on the idea of lifelong learning. An analysis of continuing training programmes, as well as a study of positive examples of reintegration into the labour market, is being carried out in partner countries.

Quality guidance is one of the prerequisites for access to lifelong learning. One project aims specifically to promote the development of vocational guidance mechanisms in order to give each individual the opportunity to obtain quality guidance. The study sets out to answer a series of questions concerning adult guidance practices and their effectiveness from the political, economic, social and individual standpoints. It also attempts to analyse in what ways the public service guidance mechanisms and those of human resource management services in business firms can be mutually enriching and contribute to the development of lifelong vocational guidance. It should therefore help decision-makers to define strategic guidelines for developing future vocational guidance programmes for adults.

5.1.7. Determining the needs of disadvantaged target groups

Disadvantaged target groups are a frequent concern of surveys and analyses projects. These projects aim to satisfy the needs of groups which for various reasons are marginalised or at risk of becoming so. For example, one study has set itself the objective of carrying out a detailed analysis of the training needs of voluntary organisations, non-profit-making associations and public institutions working with young disadvantaged people in Italy, Greece and Germany. The study focuses on the institutions working with young people who are facing problems of drug addiction, at serious risk of marginalisation or socially maladjusted. The analysis highlights the ideal occupational profile for social workers, as well as the similarities and differences between this profile and those currently in existence.

Young people leaving school or training institutions without qualifications, who are at risk of failing to find stable employment in the labour market, are a subject of concern for several projects. One such project aims to examine the institutional links between the education system, the training system and integration into the labour market in four countries (Ireland, the United Kingdom, the Netherlands and France) in order to ascertain how to improve such links and thereby reduce the risks of exclusion for young people.

For disadvantaged target groups, counselling and vocational guidance play an important role. One project studies and compares the different innovative models aimed at young disadvantaged people during the transition from school to working life in five European countries (Germany, Denmark, Finland, France, the United Kingdom and Sweden). The aim of the study is to evaluate these different approaches within the context of their specific conditions of application, and to examine the possibility of transferring good practices to other countries. Case studies are also carried out describing the various models and evaluating them with regard to their implementation in local and regional contexts. These case studies include interviews with young people, trainers, social workers and political decision-makers.

The growing proportion of immigrants and ethnic minorities in European countries calls for their specific problems to be taken into account. One project is aimed at increasing both the access to, and the representation of, such groups in jobs in the European media. The final report will highlight European employment trends in this sector. Recommendations will be made for promoting access for immigrants and suggestions for the development of special training provision.

5.1.8. Guaranteeing access to training for women

Continuing training for women is unsatisfactory Europe-wide. Continuing training provision is confused, poorly coordinated and ill-matched to the needs and private situations of women, especially those with young children or wishing to return to the labour market after a prolonged absence. A number of projects study this situation and the good practices which can remedy it.

One project aims to draw up qualitative success criteria for the occupational reintegration and continuing training of women at regional level in order to permit a transnational exchange of experiences in the field of training. This will involve reviewing the transferability of qualitative and regional success criteria. As part of a qualitative approach, the conditions for increasing the participation of women on both the supply and demand sides will be clarified.

In the majority of countries relatively few women undergo training and exercise a profession in technical fields. One project examines the possibilities for improving women's access to such professions by analysing several training strategies which have been successfully applied by employers in four European countries. General conclusions about the possibilities of transferring good practices will be drawn, based on an evaluation of their success in the context of national policy. These conclusions will serve as recommendations for vocational training centres, governments and employers.

Women returning to the labour market after a prolonged absence face special difficulties which some projects endeavour to define. One survey studies training and support strategies for women returners in four Member States. The aim is to determine the effectiveness of these different types of training in different contexts and to highlight the success factors of these measures in order to make recommendations regarding good practices. Feed-back to officials in charge of such measures will allow strategies that are already in place to be improved or refined.

5.1.9. Anticipating training needs

A number of projects have chosen the theme of anticipating training needs in order to respond to technological and social change, as well as to meet the new challenges of international competition. Several surveys and analyses study forecasting possibilities in selected fields. For instance, one study sets out to help anticipate continuing-training needs for SMEs in the metallurgical sector. The study aims to promote the acquisition of flexible qualifications and personal skills, as well as a type of training which meets foreseeable labour market needs. The shortcomings that exist in some metallurgy sectors are highlighted. Once these sectors have been identified, the partners will seek the most effective training methods for providing learners with flexible and personal skills.

Another project determines training needs in the European paper-making industry stemming from the poor match between the existing level of worker skills in this sector and new skills requirements. This situation calls for priority to be given to training and to defining the skills required for each specific work situation. The project therefore studies the skills norms, skills gaps and training needs of workers in the paper-making industry. A similar project studies the anticipation of training needs to ensure conditions of quality and hygiene in the meat-production industry. Practices in Europe are analysed and a European training programme on hygiene and quality, which includes all stages of the meat chain, is being drawn up within the framework of the study.

Since the small size of an enterprise often constitutes a barrier to vocational training (see also point 5.1.3 'Promoting innovation and training in SMEs'), anticipating the needs of small businesses is a particularly crucial and delicate matter. Measures designed to improve the performance of SMEs through vocational training must be aimed at improving human resource-related inputs. For example, the aim of one project is to develop a methodology for identifying the crucial training needs of SMEs in order to reinforce their effectiveness and encourage SMEs to make better use of such resources. The study will focus specifically on the sectors of tinplate making, machinery and equipment.

5.1.10. Setting up or reforming training for trainers

Training for trainers is a key issue for training systems. Such training is still all too often poorly organised and unsystematic because it is the result of improvisation rather than of clearly-defined political and educational choices.

Trainers working in private, semi-public or public training institutions are not necessarily able to benefit systematically from specific training to prepare them for their post. One project proposes to carry out a survey to highlight firstly the current situation regarding the level of training provision in the field of training for trainers, and secondly the needs of socioeconomic players in the same transregional context. The project will go on to identify any differences between such training provision and the needs of the players involved in order to draw up recommendations for improving this situation.

Another project proposes to study new forms of initial and continuing training for trainers. This group is seeing a need for training in fields such as new learning methods. The study aims to measure the shortcomings which exist in this target group and to promote an innovative European culture of research and development in the field of continuing vocational training. This will ultimately take the form of a transnational network of specialised national institutions. The partners are drawing up new guidelines for those involved in continuing vocational training in line with the different national systems of vocational training.

5.1.11. Comparing the training systems of different countries

There is still a great diversity of training systems and mechanisms among the various Member States as they reflect a wide variety of histories, cultures and policies. The aim of a number of projects is to study specific aspects of this diversity in contrasting contexts. For instance, one project aims to study the procedures for accrediting prior vocational training in the 'automobile trade and repairs' branch of the European automobile manufacturing countries Germany, Spain, France, the United Kingdom, Italy and Sweden. This project deals with the issue of transparency of qualifications and worker mobility. The project includes national studies based on a jointly-developed framework, a synthesis and shared dissemination of results.

A study, carried out in 1994, showed that 2.5 million people throughout the European Union were undergoing distance-training courses. However, very few studies have been conducted into the different types of distance learning, the skills acquired, their transferability and their accreditation. This is why one project is collecting data concerning such distance-training courses in order to highlight the main trends, evaluate the training provided from the standpoint of the qualifications obtained, and promote the development of a system for certifying and transferring the qualifications acquired during this type of training. The partners analyse the number of people who followed distance learning courses in the European Union in 1995 and the cost which this represented for individuals and for society. Next they analyse the transparency of the qualifications obtained during distance-learning courses, as well as their transferability. The study will lead to the creation of a European institute for the promotion of distance learning.

Another project makes a comparative study of vocational training for fire-fighters in Europe, training which at present is very fragmented and varies from one country to another. On the basis of the study, the partners define a European profile for the career of a professional fire-fighter. The study is being carried out by the 11 national associations involved in the project.

A third project catalogues the methodologies used in comparative studies in order, during a second phase, to develop a model for a comparative approach suitable for studying vocational training systems and practices. During a third phase, the approach is applied to assessment in order to identify the approaches of the different partner countries and highlight current trends in the field of assessment. During a fourth phase, a document will be drawn up to provide guidance and political support for political decision-makers and the social partners.

A final project studies the establishment of new initial training models that are accessible to, and status-enhancing, for young disadvantaged people, based on a critical evaluation of training provision in six geographical regions of the European Union. The partners are seeking easier methods of access to vocational training for such groups, attaching special importance to initial training, since negative experiences at this level often trigger a process of exclusion. They analyse national socioeconomic and education systems and their causal relationship with social exclusion in each of the six countries and explore possible avenues for effectively combating this phenomenon.

5.2. Principal methods used

An analysis of the projects revealed a great wealth and diversity of methodologies but since for most projects the description of these methods is very brief, any analysis of such methodologies can only be indicative. Furthermore, we note that projects usually make use of a combination of methods. In addition, many projects do not indicate a methodology at all, instead presenting under this heading a conceptual framework, work hypotheses and/or a work plan. For the sake of convenience, a distinction has been made between quantitative and qualitative methods. However, we often find a combination of the two approaches.

5.2.1. Empirical methods

Strictly quantitative methods are rarely used in isolation, and they are not the favoured survey tool. They include:

- surveys by means of questionnaires, with questions being either open (i.e. they require written answers) or closed;
- analysis of existing statistical sources;
- implementation of econometric or statistical models.

5.2.2. Qualitative methods

Qualitative methods are much more often used. They are mainly:

- reviews of existing literature, especially with a view to making international comparisons;
- (comparative) analysis of documents;
- meetings for exchanging information and experience, followed by minutes;
- interviews of managers, experts or informed observers;
- sample interviews, which may be of people undergoing training, workers, or people belonging to target groups;
- participant observation;
- case studies, often with the aim of highlighting 'good practices';
- action research.

6. Concluding remark

In view of the quantity of projects selected for the surveys and analyses strand, we see a great diversity of themes. Generally speaking, studies to determine and improve skills and qualifications, including proposals for improving continuing training are the most represented. The cost-benefit ratio of training measures, innovation and training in SMEs, skills certification, enhancing the status of initial vocational training, access to training for all, the needs of disadvantaged target groups, access to training for women, anticipating training needs, training for trainers, and the comparison of training systems in the different countries are just some of the other representative themes tackled by the various surveys and analyses selected by the Commission.

A great diversity of both empirical and qualitative methods, is also in evidence, with several methodologies frequently being combined and a clear preference for qualitative methods.

B. Anticipation of qualifications and competencies – Main outcomes of selected Leonardo da Vinci projects

Burkart Sellin (1)

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Conclusion 313

1. Introduction

This study was realised within Cedefop's activities of research, studies and analyses undertaken on **'European trends in occupations and qualifications'** both within Cedefop's thematic network (Ciretoq (2)) and within major European action or research programmes (3) and concerns **intermediate and final results of pilot projects and surveys and analyses undertaken under the Leonardo da Vinci's first and second calls for tender 1995 and 1996.**

This preliminary analysis is based on a selection of 16 projects, their outcomes, products and publications and on documents published by the European Commission in the framework of the Leonardo da Vinci Programme (4).

In that context BBJ (5) was asked by Cedefop to proceed after their collection at a first tentative analysis of their results as well as to assist Cedefop in the writing of this summarising contribution. Its aim is to both appreciate the outcomes and to put these into the context of the themes 'development of qualifications and competence' and 'European trends in occupations and qualifications'.

Projects selected to contribute to this report were initially chosen in May 1998 with the assistance of the Leonardo da Vinci technical assistance office (Brussels) following the Leonardo da Vinci call for proposals for 1995 and 1996. The selection criteria for the projects were the following:

- The Leonardo da Vinci Compendium and CD-ROM 1995/1996, with particular emphasis on Strand 2.III.a) projects (i.e. surveys and analyses);
- Key words included in the title and outline of project summaries (e.g. anticipation, training needs, qualification and competence as well as occupational trends and profiles etc.);
- Screening of their thematic relevance by Cedefop.

It should be taken into consideration that the majority of 1995 projects did not start before the end of 1996 and most projects from the call for proposals from 1996 did not start until the end of 1997.

It should be noted that the pilot projects, studies, surveys and analyses are all placed from the outset in a specific context and related to a given problem, issue or theoretical principle which is drawn from that context and identified for discussion. It is instructive to establish a link between a general context such as industrial change or the introduction of new technologies or working practices, etc. and the specific problem or issue relating directly to the promoter and subsequent project leaders. Only in the rarest of cases are projects, surveys and analyses in particular, under the European vocational training programmes designed purely for the purposes of knowledge acquisition or basic research; they are generally highly practice-orientated. In this they are examples of what might also be described as task-orientated or applied research, where the aim is to provide on the one hand models of action for decision-makers in the political, social and economic sphere, and on the other practical knowledge and results which can be used as the basis for the planned project development.

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(1) Responsible within Cedefop: Burkart Sellin, Ciretoq Coordinator.

(2) Circle on trends in occupations and qualifications, set up by Cedefop and working since 1995.

(3) See also: summary of the outcome of the last Ciretoq plenary meeting, organised by Cedefop in Thessaloniki on 15 and 16 June 1998 in cooperation with the European Commission, DG XII (TSER-programme unit).

(4) Special thanks goes to the colleagues who were responsible from the Leonardo da Vinci technical assistance office in Brussels which assisted both Cedefop and BBJ in the collection of the necessary documents and in the establishment of contacts with the projects chosen.

(5) BBJ SERVIS für Jugendhilfe, Berlin, Brussels office.

Projects under the Leonardo da Vinci programme differ widely in their topics, methodological approaches, partnerships and objectives. Diversity is easy to explain; the invitation to make proposals for Leonardo da Vinci is widely open. That is in itself a great advantage, even if it does complicate matters, however.

Explaining diversity is one thing. Enquiring into its justification is another and far more complex issue. The survey and analysis concept within the Leonardo da Vinci programme is clear in the sense that it deliberately differs from fundamental research. It tends rather to fit into a logic of applied research, situated above or below the level of individual projects as such. In a field as complex as that of vocational training with these multi-faceted realities, the surveys and analysis approach represents a useful contribution to the debate and clarifies and maps out the path to be followed.

2. The social and economic challenge

In this report an attempt has been made, not only to embrace projects, providing for an equally balanced insight into trends and the respective progress in vocational training across Europe, but also to cover sectors and industries to reflect recent more specific trends in occupations, training provision and qualifications. Accordingly, traditional industries such as construction, metalworking, paper and pulp, food, education and tourist sectors are represented. Other branches are also encompassed which may be regarded as being among leading edge industries such as mobile phone and mobile forestry equipment production. Projects dealing with human resources and SME development, the non-profit sector and the issue of equal opportunities are also included.

Crossing the range of sectors covered by the projects, the results show that a number of convergent trends exist between projects, particularly regarding possible reasons why new skills and occupational profiles are required. The Synthesis report (Synthesis S.A., project number -3755-, Greece, 1995) explains that the single European market, as well as the global market, as a result of agreements with the EU and GATT (General Agreements on Tariffs and Trade), is one of the main reasons for adapting and changing occupation and training provisions/systems. Internationalisation accompanied by an intensification of technological advancements has resulted in structural changes in the economy, provoking massive social problems and new demands on qualifications and competence building of the labour force. In developing a model scheme for the anticipation of skill and qualification needs in the human resources sector, the Synthesis project reflects that a possible facilitator in identifying forthcoming skill and competence needs should take the form of a locally based system to anticipate skills because accelerated economic and technological developments are too rapid for the education/training systems to adapt with the necessary speed.

In the metalworking and food industries, the quality management and qualification needs analysis (QMQNA) project (IFW, Germany, 1995), demonstrates that sensitivity to cyclical influences and global competitive pressures, in particular with mass and standardised products, e.g. from south-east Asia and from the new market economies in eastern and central Europe have increasing effects especially on SMEs. Perhaps with this in mind, the SAGE (strategic approaches to a global economy) project (WDA, UK, 1996), although accepting that SME issues are quite different in each region due to cultural background and business procedures, aims to elaborate an innovative management development programme for key decision-makers in SMEs, which will in turn increase the capacity of SMEs to respond to the challenges that internationalisation poses. The project underlines the fact that SME-managers focus mainly on the day-to-day concerns of running businesses. In their eyes, taking time to consider long-term business issues seems to be a luxury. However, companies need to be aware of the wider business environment, if they are to profit from opportunities and overcome competitive challenges.

An additional action research aspect of the SAGE project is that women face particular barriers in their efforts to become more engaged in international activities. The network – new job profiles project (BIBB, project number -3108-, Germany, 1996), also believes that with the current breaks in tradition, the opening of new occupational profiles in the international approach can provide new opportunities for women, particularly if innovative capacities become integrated into education and initial vocational training programmes for women. A second project with the title 'Joint-teleworking system' (GFQ, Germany, 1996), has as an objective the provision of a joint-teleworking system which places a particular emphasis on the role played by women in the present labour market. This stems from the fact that many women go through periods of deskilling during maternity leave and in turn are able to reintegrate into the labour market only by accepting below-average jobs. Teleworking, a relatively modern occupation, can been seen as a future-orientated occupation, particularly for women, and as a result can be offered on return from maternity leave. The integration of electronics into production, particularly teleworking techniques, enables work processes to be linked by removing the obstacles associated with distance. The new qualifications acquired by trade union representatives will enable them to participate effectively in the European debate which has begun on this subject.

With reference still to the ever expanding markets, the Glotrain project (University of Bremen, Germany, 1996), displays that engineers need to be placed in the position of possessing more practical experience, creating a direct link to the theoretical knowledge gained through study. The project aims to impart key skills to engineers which do not form part of their education, including teamwork (often in international teams), commitment to quality and target group orientation.

Internationalisation as a process will have its affect on the environment as well. Such an influence has a direct impact on companies facing the conflict of progressing and using new technologies in order to reach environmental requirements, and at the same time providing top quality products customers demand. Due to the fact that it is commonly recognised that future growth and prosperity depend on the ability to remain competitive, it is necessary, as detailed in the study of the professional training needs in the European pulp industry (Universidad Complutense de Madrid, Spain, 1996), to identify the skills that are necessary for each working place and to make sure that the people concerned have or can have access to these skills. It is necessary to achieve the maximum potential from all this and allocate human resources better. Priority must be given to training centres and industries, which have to define their own qualifications and standards needed.

This project elaborated three questionnaires, by which the economic and social situation of the respective industries and the training needs of the employees will be analysed. These tools will enable a proper statistical analysis of the training situation in the pulp and paper industry. As a final result a manual will be published which describes and assesses the present situation of the industry in Europe. The results will represent an important step towards a better qualified and skilled staff and permit an increased knowledge of the pulp and paper industry in general.

Ecological Training in Europe (Austrian Ecological Institute (ÖÖ-I), project number -353-, Austria, 1995), has recently completed a study which aimed more specifically at developing a recognised ecologically-based qualification and training programme. Having interviewed 45 companies in the tourism industry, it appeared that ecological or environment-related qualifications did not get more attention so far, only a few training courses in this sector included an ecological module as part of their training provision. Within the SMEs dominating this sector, recognition of the need of new skills arises only if a respective offer of training courses is available. Another project, European Environmental Engineers (FR/95/116/III.2.a), develops a common framework for understanding differences and similarities in training provisions in universities and higher education between the participating countries, in order to show what development possibilities exist for the creation of a transnational qualification for environmental engineers.

Diverging from more commonly known reasons for changes in training needs, the project New Skills for New Futures (Fedora/VUB, project number -1477-, UK/Belgium, 1996), provides evidence that substantial changes are also under way in the education sector. Essentially, in terms of input, students entering higher education constitute a more diverse population than previously: i.e. increasing numbers of mature, part-time, ethnic minority, distance learning, international and disadvantaged/handicapped students. In terms of output, expansion has meant that higher education now interfaces with a much wider sector of the labour market than before. The project itself uses a very innovative method of analysis, which shall be discussed in further detail later in this paper.

In summarising the various influences on occupational profiles therefore, the increasing internationalisation (including single market, European monetary union and the opening of central and eastern European countries), the environment, technological change and considerations of equal opportunities and equal access to education and training all play a significant role in the foreseeable trends in occupational and qualification/competence development.

Permanent systems of observing these trends on the company, local, regional, and sector level as well as on the national, European and even international level seem to become a crucial necessity. A new approach is desperately needed to analysing and identifying skills and competencies in terms of supply and demand, to convening on occupational and competence profiles and to transmitting the respective know-how into old and new education and training provisions and occupations in the European labour market. The instruments available no longer suffice in most if not in all Member States of the European Union.

3. Skills, competences and qualifications, methods for their anticipation (6)

After having explained the projects' contents, it is necessary to consider the methods. The project with the aim of evaluating future priority competence and training needs in the construction sector, (FIEC, project number -3699-, Belgium, 1995), believes that major trends in skills and qualifications are converging, but it adds that at the present time and in the medium term four types of skills will be called for:

- basic technical skills and competencies equivalent to those of a traditional skilled worker;
- social, organisation and communication competencies; technical know-how only, though increasingly necessary, would no longer be sufficient;
- complementary technical skills and competencies for the purpose of integrating and adapting on a permanent and ongoing basis to change, to master developments and to steer their orientation in teams;
- skills relating to compliance with regulations in order to take account of new obligations, in particular those relating to health and safety and to the protection of the environment.

Although this project demonstrates no self-evident innovative method which could back the presentation of such criteria, and although it is almost exclusively related to the construction sector, it is clear that in linking the outcomes to those of the other European projects detailed in this report, we can conclude: not only do analogous structures exist in general, but there seems to be also a convergent trend in terms of efforts to the anticipation of future skills. The criteria listed above could thus be of comparable importance to other sectors, especially those which have a similar structure, as for instance the metalworking sector.

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(6) See also: 'Short glossary of terms proposed by Cedefop' a paper submitted to the Conference on European VET in Vienna in July 1998.

With regard to the orientation for preventive European vocational training strategies, the QMQNA project concludes that highly specialised occupational profiles appear to be unsuitable. It suggests that a cross-occupational modular structure with possibilities to specialise may make more sense, as training strictly geared to specific (heterogeneous) company needs raises the question for the trained staff, whether the acquired qualification is generally acknowledged. This project aims to carry out case studies in companies in the metal sector and in the food industry, together with a comparative study concerning approaches in the different countries and sectors represented in the project. Cross-occupational training takes place rather selectively and is driven by heterogeneous company motives: requirements of the use of new information technologies, cooperation of specialists required by the product engineering, the company's interest in flexibly employable staff, demands of the ISO quality management systems etc.

Therefore, the IFW proposes that such training modules should be increasingly developed in networks of companies and/or federations of enterprises, in order to try to avoid such dangers.

Another proposal following this line of thought refers to the need for setting up a more permanent employment and qualification observatory, which was recently launched under the guise of the Racine project (FORCO, France, 1996). The project aims to produce a Europe-wide linked data bank system able both to quantify differences and developments in qualification requirements and to anticipate labour market demand. Such a system, providing for an observatory of employment, occupations and qualifications, was established intentionally for the sales sector. The project follows on from a programme based in France, which involved the participation of 920 000 companies and 2.5 million employees.

It hopes to achieve the following goals:

- a quantitative diagnosis of the labour market situation concerning the employed and unemployed in the sales sector;
- providing a compilation of statistical data for the occupations covered;
- closely following the development of employment and of occupational competencies in order to evaluate them in both qualitative and quantitative terms.

Concerning the main objective of creating a long-term observatory of this type, preliminary or final results are not yet available. Statistical analysis, however, by using a similarly innovative method, is embodied in both the Fedora project (cf. p. 306 above), and the OPAQ project (National Board of Education, Finland, 1995). As is striven for in the Racine project, both the OPAQ and Fedora projects assert that vocational education and training needs a constant updating. As has been specifically demonstrated in the OPAQ method, which deals with mobile forestry equipment and mobile phone production, technical and organisational innovations in business and industry have to acquire the knowledge and know-how to enable them to develop training plans and training systems on different levels. This project's results will differ according to the partner country. In Finland, a database bringing together information on the professions will be created, to be used in the development of a curriculum, to evaluate skills and the training centres. In Scotland, the Dutch method will be tried out and compared with British classifications systems. In Portugal, the project will contribute to the development of concerted policies between vocational training, the job market, vocational information and vocational training centres. In Finland, for example, future analysis is a crucial part of the OPAQ procedure. One constructive way to make future trend analyses is to predict changes in work content (activity clusters) and work profiles. However, this will be done by branch experts; questionnaires and interviews with production managers, new systems, instruments and techniques ought to be tested and be properly implemented for a more permanent, reliable and efficient, quick and comprehensive analysis of skill and training requirements to be applied at local, regional, sector and national or even on the European (EU-) level.

Although the sectors dealt with in both projects are dissimilar (Fedora covers higher education guidance and counselling services), both carried out a qualitative statistical analysis whereby a pragmatic approach was adopted in order to cluster the roles of the particular sectors (also known as a taxonomy of roles). After the completion of a questionnaire by the occupations concerned ([7]), activity clusters were formed containing specialised occupations of a similar nature for the particular sector. The larger of the two projects, that of Fedora, which evaluated its sector on a Europe-wide basis, concluded that the continuing expansion of higher education and its reshaping within the context of lifelong learning pose considerable challenges to guidance and counselling services. Moreover, in strengthening the European dimension in guidance provision, the project proposed to introduce a European masters degree, which can be constantly evaluated and updated to reflect the fluctuations in the available statistical data.

Within the second branch chosen for analysis by the OPAQ method, (i.e. mobile phone production), after it was divided into activity clusters, a list of 'ten must skills' was formulated, which for the purposes of this sector, 70–100 % of respondents in mobile phone research and development (R & D) announced they were able to perform. These were:

- ability to use modern communication channels;
- computer skills;
- personal communication skills;
- language skills;
- discussion, negotiation, analytical and solution skills;
- skills to maintain work capacities;
- teamwork skills;
- quality knowledge;
- knowledge of mobile technology;
- ability to report on one's own work.

The four criteria detailed in the FIEC project together with the following essential qualification requirements for engineers as proposed by the Glotrain demonstrate similarities, albeit dealing with different sectors:

- knowledge of operation and implementation of modern cooperation technology;
- computer skills;
- teamworking ability;
- cooperation and teamwork skills in spite of spatial separation;
- intercultural skills;
- ability to work with complex systems;
- interdisciplinary abilities (cross-occupational skills);
- creativity and responsibility.

Both lists show that the skills and competencies required are diverging and expanding from what would traditionally only, or at least merely, be used to catalogue a task list for professional engineers or R & D officers. They are covering fields which as such do not serve exclusively the respective requirements for performing in the given sector. These skills and competencies could also be projected onto other sectors and occupations, even onto those needed which ought to fulfil mere 'social activities' as they are referred to in the OPAQ report.

It is important to remember that the results from both the OPAQ and the Fedora study are direct products of an analytical tool. The authors of the OPAQ method believe that as a method, it is transferable to the following sectors which were analysed: occupational profiles of construction work, restaurant work, elementary school teachers, grocery store merchants, banking personnel, etc.

One of the two main advantages of the OPAQ method is that it provides a precise description of occupations (i.e. activity clusters); and can also be used as a tool by researchers not familiar with the branch being analysed.

However, as with any similar method there are problems associated in so far as it:

- does not collect information on the skills, competencies and knowledge needed to

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([7]) Concerning the OPAQ project, it should be noted that the response to this voluntary questionnaire was high, because a family holiday was donated by a local firm for the first questionnaire in the framework of a lottery.

accomplish the activities or the possible attitudes, values and ethics that affect these activities;

- emphasises those activities that appear to be clearly distinctive and which produce some sort of apparently concrete output;
- does not seem to be adaptable at small branches merely due to cost factors.

To conclude this particular part, such observatory tools provide for excellent elements for the appreciation of trends, challenges and new developments linked to business and work having an important impact on skill and competence prospects. With this in mind, and considering that these instruments would be transferable and applicable on a European level, educational goals, curricula and teaching content can be altered accordingly so as better to meet and to anticipate working life, employment, social and economic developments.

4. Short information on the main relevant projects, which promote new methodological approaches, under the 1996 calls for tender and their differences with the 1995 and the 1997 ones

Before commenting on further anticipatory methods, the following list of 1996 projects has been compiled, where it is believed that the potential results could have a wide-reaching effect on better analysing and observing trends in occupations and qualifications in Europe. Because of their late approval, the results will not be available until the projects advance further in the light of their respective individual time frames.

- *The major difference between the 1995 and the 1996 call for proposals* is that in 1996 a significant number of projects feature research aspects in the field of analysis and improvement of the learning process, and most important of all, are to a much larger extent than in 1995 oriented towards the labour market. The themes of the projects in 1996 are more job-related and also deal more with the issue of transition from school to work or the social and professional integration of disadvantaged target groups. Apart from this, however, no further significant difference between the 1995 and 1996 calls for proposals can be identified. The 1997 call for proposals is again more centred on competence and training needs analysis, adaptation of training systems remaining an important topic and evaluation of new methodological approaches becoming a significant issue. Sectoral approaches and comparative studies remain important. A new trend towards more regional approaches can also be noticed.

- *Eurovitiqualification (Project number -553-France, 1996,* The coordinator of this project is the French company FAFSEA). This project aims to develop a vade-mecum in the form of a methodological tool to be used as an approach for the anticipation of management skills and qualifications specifically in the wine-producing sector. Secondly, it hopes to conceive a system of surveying the evolution of occupational skills in this field on a European dimension, creating performance indicators with the eight partners involved. This project also involves the setting-up of a monitoring system for use by companies, trade unions and regional authorities. For this purpose, the project will be creating an information system with basic tools for the further development of the training of engineers and of personnel managers in various sectoral and regional viniculture operations.

- *Training requirements in tourism (Langer Expert Services, project number -1244-, Austria, 1996):* Experience from educational and training establishments and employers and employee unions (social partners) shows that education and training in microenterprises and SMEs with 1 to 30 employees, in the tourism industry quite often lack efficiency. Therefore, the project aims to forecast the demand for competencies and qualifications within SMEs in tourism on a long-term basis, bearing in mind that lifelong learning should be promoted by analysing the requirements, by defining appropriate methods and by analysing the willingness to gain further vocational education.

- *Development of human resources training requirements in the European non-profit sector (Ecoter, project number -1056-, Italy, 1996):* With the increased social recognition of the value of non-profit initiatives and the increase of government initiatives in favour of the non-profit sector, the passage from a pure 'voluntary' work logic to one that enhances 'market elements' should be assisted. Through carrying out corresponding surveys, the project wants to contribute to a fostering of continuing education and training in non-profit organisations, to adapt the professional skills and competencies of workers for the development of the sector, and to increase the efficiency of the voluntary work force.

- *Strategic approaches to the global economy (SAGE, WDA, project number -406-, UK, 1996):* in addition to what is mentioned on p. 305 above, the project aims to produce a globalisation and a business characteristics matrix for each SME involved in the project; a video, based on case studies and accompanying toolkits and training modules; a workbook, guidelines and a diagnostic toolkit; 'company to company' training modules and courses; and development of new regional business support programmes for SMEs. This in turn will assess areas of the key impact of SMEs in relation to global developments. The SMEs will establish an ongoing network through cooperation in the transnational workshops, and in drawing up the management development programme.

- *Study of the professional training needs in the European pulp and paper industry (Universidad Complutense de Madrid, project number -3376-, Spain, 1996):* Through enquiry and analysis, this project will establish skills/competence standards as well as identify skill/competence gaps and training needs for employees of the pulp and paper industry. This will be accomplished by employing an analytical tool created for the purpose of this analysis, which should provide a basis for achieving agreements between management, employees and trade unions about the best way to close gaps in training and to draw up a general training plan for the industries concerned. It is hoped that the maximum potential from all resources and a competitive edge can be achieved, and at the same time, that employees will get the best and adequate training which is linked with and tied in to their career needs, and all this at the right time.

- *A more specific method originates from the SUM project (SUM Secretariat, project number -2619-, Denmark, 1995).* This method is based primarily on the company organisation itself, after which the management and employees are analysed providing a situational analysis, establishing what needs to be developed, and then thirdly, implementation and follow-up. The initial analysis, or situational analysis, is covered extensively within the SUM Express manual, which proposes three analytical tools in order to cater for development needs:

- *The mirror analysis:* the objective of the mirror analysis is to cover possible development needs for a department or an entire company. This is done by comparing the surroundings' evaluation with the unit's own evaluation. In other words, the mirror analysis is a good tool for a situational analysis and serves as a starting point for discussing development needs.

- *The experience analysis:* the objective is to assess important events in the company's past in a constructive way, so that successes can be repeated and problems may be avoided.

- *The SWOT analysis:* here the objective is to create clarity of a company's or departments strong sides, weak sides, opportunities and threats. This way the company is provided with a general outline of areas on which it should concentrate on its development resources.

  This method of analysis is very simple to follow, practical and contains common sense. It can be applied to individual departments or indeed to whole companies. However, without any practical example for such a method it is hard to evaluate its potential for success at face value. Nevertheless, such a tool could be suitable for the analyses required in the modern market and certainly deserves an attempt; which could take the form of a pilot project.

- Similar to the Racine project mentioned, the Synthesis project proposes to create a local instrument to anticipate skills/competence needs and offers valid points for forecasting those needs in the respective primary, secondary and tertiary sectors.

  The basis of the project's findings stems from the prerequisite stating that it is widely accepted that personal and business success is associated with skill/competence development, depending, however, on the extent to which there really exists is a market demand. In the UK no more permanent mechanism has ever been established to forecast skill, qualification and competence needs wanting to support a medium and longer term VET-development. Since its first attempts between 1966 and 1976, Germany has been increasingly successful in the deployment of trends serving the policy-making as a result of its integrated method of data collection, research and projection. In Greece, despite systematic efforts, successful forecasts of skill needs and competence demands have not yet paid off. However, in Ireland an improvement of forecast systems has been undertaken increasing their reliability. Whether they could in themselves guarantee that a lack of competencies can be avoided remains to be seen.

  The report provides some short conclusions on the anticipation of needs in each sector.

- *Primary sector:* estimates here are relatively simple as the occupations associated with agriculture are easily defined, whereas the impact of new technologies seems to be rather limited.

- *Secondary sector:* production processes are related to mechanical equipment and the technology applied by the enterprise itself. Therefore, by registering production stages per sector (as done in the OPAQ and Fedora methods above), it would be relatively easy to determine the occupations associated with it and thus target groups for vocational training programmes. Therefore, trends in unemployment and employment changes (increasing, decreasing and stable) in qualifications and skills could be noted and later on taken into consideration.

- *Tertiary sector and services:* occupations can be transectoral (cf. IFW project, University of Bremen 'cross-occupational' skills,), i.e. salesmen in general, tourist professions, bank employees, private enterprise consultants etc.

An additional point of importance raised by the Synthesis report, is that it strongly recommends that the prevailing vocational education and training policy is made publicly known, so as to let the public know about the occupations in demand, trends and occupations in decline, etc. Such a role, the project proposes, could be fulfilled by a PEPA (a regional observatory), which would act as a mechanism to monitor the labour market as follows:

- to collect and register statistical data;
- cooperate with all involved actors and/or enterprises with the aim to integrate eventual surveys or analysis. This mechanism should collect quantitative as well as qualitative data directly or indirectly related to the skills requirement forecast.

Results would be made available through dynamic and united information systems based in PEPAs and made available and accessible to everybody through a shared database.

Perhaps one could compare and contrast this project by putting it alongside the above-mentioned Racine project, evidently after the results for this latter project have really been obtained. The Racine project essentially embodies, albeit on a European level, a possible prolongation of the Synthesis project proposal.

The Fedora and OPAQ methods are very innovative and accurate, both of which could be used as an observatory instrument on a respective level (regional, sectoral or covering an important transversal occupational field, e.g. information and communication technologies). The demonstration by the Racine or Synthesis projects proves that mechanisms for analysing future trends in occupations and qualifications/competencies do work effectively and deliver important findings for policy-makers, social partners and practitioners even on the European level.

5. Principal methods used and preliminary conclusions – some further thoughts ([8])

Research into the observation, anticipation, forecasting or projection of trends and developments concerning qualifications/competencies and employment/occupations does not necessarily mean a clear anticipation of a more or less precise number of labour force and skills/competencies needed in a given sector, region, occupational group etc.

The whole range of intervening factors, categories and parameters should be taken into account and the whole multiplicity of trends should be permanently observed, assessed and disseminated, and secondly, the respective findings should effectively, rapidly and permanently be translated into VET-provisions, contents and structures.

The outcomes and products, elements and the findings should at least be used to allow for experimental training programmes to be put into practice at least on the level they have been observed.

Effective instruments and tools do exist and do work. However, it is up to the social partners at the respective level, the branch organisations and the public bodies which have political responsibilities, to draw the necessary lessons, to allocate the necessary funds and human resources for undertaking the necessary VET and labour market research, to enable and improve information and guidance systems and to deepen their impact.

If the results have not always been as good as has been expected, this can only partially and in individual cases be linked to the individual project's performance. By and large it seems that the results and outcomes of the projects covering the issue of anticipation, which have been analysed so far, both with the method and under the criteria mentioned above, have been extremely useful. The partner countries concerned and the European Commission should do the utmost to disseminate the results further, to draw lessons, and above all to implement the main outcomes properly.

The results of the projects should contribute to innovations both at policy level and in terms of higher standards in vocational training systems and in corresponding practices in the respective industries, for example. For that reason it is generally necessary to draw up some more general guidelines on the basis of the results obtained. What is innovative about these projects is that, from initial idea to result, the full sequence of requisite stages and principles is planned.

This is the only way to achieve a degree of control within the project management and to ensure that the quality of the research is mirrored in the quality of results, as that is the legitimate way for the projects to bring about change, or in other words for the surveys and analysis to have a real impact. That word creates expectations: an impact which cannot be discerned is not perceived as such. There is no automatic relationship between impact and innovation. Innovation as such is relative: something which proves highly innovative in one context may already be obsolete in another. Moreover, innovation must also be seen in its evolutionary dimension.

An analysis of the projects revealed a great wealth and diversity of methodologies but since for most projects the description of these methods is very brief, any analysis of such methodologies can at present be only indicative. The projects usually make use of a combination of methods. A distinction has been made between quantitative and qualitative methods.

([8]) These are based on the findings of the respective Leonardo projects but can by and large also be confirmed by Ciretoq's studies and experience, Cedefop's thematic network on researching trends in occupations and qualifications; see more especially Cedefop-Panorama *Research cooperation on trends in occupations and qualifications* (EN, FR, DE) intermediate report, Thessaloniki, 1998.

However, we often find a combination of the two approaches:

A. Quantitative methods are rarely used in isolation and they are not the favoured survey tool. They include:

- Surveys by means of questionnaires, with questions being either open (i.e. they require written answers) or closed.
- Analysis of existing statistical sources.
- Implementation of econometric or statistical models.

B. Qualitative methods are more often used:

- Reviews of existing literature, especially with a view to making international comparisons.
- (Comparative) analysis of documents.
- Meetings for exchanging information and experience, followed by minutes.
- Interviews of managers, experts or informed observers.
- Sample interviews, which may be of people undergoing training, workers, or people belonging to target groups.
- Participant observation.
- Case studies, often with the aim of highlighting 'good practices'.
- Action research.

Conclusion

The systems of regular training provision within most Member States could learn a lot from the respective projects' outcomes. The procedures of decision taking and of dialogue between the different actors taking decisions on provisions of training both inside and outside companies as well as on the different levels of policy intervention could apply and use the tools and instruments developed and should take the necessary steps to put these into practice.

For vocational training is to supply ever newer solutions at ever greater speeds, at a time when unemployment is rising and businesses are feeling the drive towards competitiveness ever more keenly, yet the sector is given neither the time nor the resources to back the proposed measures with scientific evidence and control. The European Commission's vocational training programmes do offer a way of reconciling scientific rigour and relevance for training practice, however, in that they support research projects designed to develop and test new methods and approaches while incorporating a direct practical reference in their procedures. The extremely complex issue of content aside, what is essential *is the quality of the research and the innovative dimension*. The primary concern must be to develop projects which provide for a sequence of well coordinated and methodologically founded stages, stretching from the original idea to the final result, and which are no longer confined to ad hoc investigations of isolated topics.

The theme of anticipating training needs respond to technological and social change, as well as to meet the new challenges of international competition. The aim is to promote the acquisition of flexible qualifications and personal skills, as well as a type of training, which meets foreseeable labour market needs. The anticipation of training needs also ensures conditions of quality and hygiene for example in the meat-production industry. Anticipating the needs of small businesses is a particularly crucial and delicate matter. Measures designed to improve the performance of SMEs through vocational training must be aimed at improving human resource-related inputs.

C. Prospects and possibilities for European VET-research

Michael Kuhn (1), *Erhard Schulte* (2)

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Summary and outlook

Research into education and vocational training on a European scale, as we all know, has to deal with a variety of national and regional education and training systems. Too little attention, however, is paid to the fact that research cultures also differ. Alongside the evident differences between systems and cultures are equally evident common features, especially if we consider the challenges confronting the vocational training systems in the EU Member States as processes of profound social, technological and economic change unfold. The question is how these common features and differences can be blended into a new fruitful concept of European vocational training research in which Europe's innovative potential can also be more fully developed. What is the significance, in terms of substance, methodology and organisation, of the 'collaborative' system of vocational training research that is being proposed here? This paper seeks to answer that question and to examine the various forms of research cooperation.

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Another issue is how to make better use of the findings and the potential of research in this field or, as the case may be, how to make it usable. Lastly, the question of synergetic effects arises in connection with pending and completed projects, such as those covered by the Leonardo da Vinci programme and by other EU programmes and activities. How can these projects provide a greater amount of spin-off, for example by contributing to the development of a European vocational training research agenda? The main focal point of this paper is the present state of vocational training research at EU level, but we shall also try to examine possible future developments in this field of research.

1. Introduction

There is no doubt about it: all the major academic and political documents that have been published in recent years testify to the fact that we are living in a period of fundamental social, technological and economic upheavals. The main transformations relate to the development of the 'knowledge-based society' or 'information society' and to the phenomena commonly described as the 'second industrial revolution' and the 'globalisation' or 'internationalisation' of the national economies on which our attention has hitherto been focused. Other profound changes, such as the social and demographic metamorphosis of societies and the integration of a world previously divided into ideological camps, are universally recognised as having confronted the realms of politics, science and research with extraordinary challenges.

In the domain of education and vocational training policy and the accompanying research, the consequences of these developments in terms of elementary challenges to education systems are the subject of debate. The discussion on the need for renewal of education and training systems and on the priority areas of the educational research that would prepare, accompany and support the reform process is also dominated by issues which reflect the impact of the aforementioned upheavals on systems and subsystems.

It is surely due to the global nature of these challenges, to their massive dimensions and their intricacy, that another fundamental social and political transformation is attracting far less attention. It is certainly remarkable that, even in European education-policy documents, the problems arising for education and vocational training from the integration of the countries of Europe, from the harmonisation of their social systems and from the emergence of a European society are usually mentioned more or less in passing.

The relevant documentation produced by official bodies focuses primarily on the consequences of the global knowledge and information society (³) for national education systems and less on the implications of an integrated European labour market and of the harmonisation of social systems or even on the development of a 'European system' of education and vocational training.

The fifth framework programme for research and technological development, which will shortly be adopted by the EU, has the distinction of being the first official document on European research policy in which the term 'European society' is used and is established as a subject of socioeconomic research (⁴).

The term 'European educational area', introduced in more recent Commission documents with which we deal below, reveals an effort, albeit still rather tentative, to define a new strategy for the establishment of a genuine 'European education policy' while upholding the subsidiarity principle and respecting the unique features of the various systems and cultures. Problems relating to the identification of a European education policy, based on and supplementing national education policies, demonstrate clearly why the concept of a 'European society', which cannot be, and would not want to be, a uniform entity, merits far greater atten-

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(³) Cf. European Commission, *White Paper on teaching and learning: towards the learning society*, Luxembourg, 1995.

(⁴) European Commission, Proposals for European Parliament and Council Decisions concerning specific programmes for the implementation of the fifth framework programme of the European Community for research, technological development and demonstration activities (1998–2002), 1998.

tion from social and educational researchers than it has hitherto received.

As socioeconomic conditions converge, education and vocational training are confronted with challenges of a very practical nature throughout Europe. Accordingly, education and vocational training research must also take account of the fact that the problems inherent in 'national' education systems are no longer its sole point of departure. It must now concentrate on providing responses to common and cross-system challenges.

In other words, the prevalent tradition in most EU Member States of basing the logic of vocational training research on the national systems and institutions or statutory regimes must give way to supranational and, in view of the progress achieved in integration within the EU, to genuine European vocational training research. This development and its consequences, not only in substantive, organisational and procedural terms but also in terms of methodological approach, must be clarified as a matter of priority.

2. Trying to define European vocational training research

2.1. The geographical dimension

The difficulties encountered by anyone who tries to define the European dimension of vocational training research are a reflection of the contradictions inherent in the concept of European integration as well as of the status quo in the Europe of the EU. The fact is that the concept of European integration contains much that is diverse and often conflicting, such as the invocation of a common cultural heritage that is supposed to foster a European identity versus the emphasis on national and regional diversity, regarded as a pollinator of the integration process. This is the same dichotomy that exists within European education and vocational training and within the related field of research.

Defining the 'European dimension' to which many documents refer remains a problem, given the complexity of European integration, especially when, as in the case of research into occupations, qualifications and education, we are dealing with cultural phenomena which, in many instances, are centuries old. A geographically-based European identity therefore still appears to be an open issue in every sense. For example, in a fairly recent document produced by the European Commission, namely in its communication to the Council and the European Parliament entitled *Towards a Europe of knowledge*, (5) which aims to lay down a basic position and proposes guidelines for future Community action in the domains of education, training and youth policy, the message conveyed is that the term 'European educational area' is to be interpreted as broadly as possible, even in geographical terms.

European research into education and vocational training should not therefore be confined to the Europe of the present 15 Member States but must also include all the countries of central, eastern and southern Europe which are interested in acceding to the European Union and meet the basic accession criteria. This, of course, does not make things any easier when it comes to defining the research targets in this field, because research priorities will have to be rewritten and rearranged, especially in the realm of vocational training, in the countries whose economic and political systems have been undergoing radical transformation. However, it is necessary for all countries concerned to meet the challenges involved in adapting to the new system, challenges that confront not only future Member States but also the present members.

2.2. An academic discipline in its own right?

The attempt to define European vocational training research becomes even more complicated when, in addition to the geographical circumscription, we seek to establish the credentials of European vocational training research as an academic discipline in its own right.

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(5) European Commission. *Towards a Europe of knowledge*. Communication to the Council and the European Parliament (COM(97)563 fin.). 1997.

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We have already mentioned that the systems of vocational training in the European Union are extremely diverse and are rooted to some extent in age-old traditions which bear the imprint of national economic, social, cultural and educational history. Another major factor resides in the differing models of political control within which the various educational and vocational training courses and institutions operate. The diversity of the systems, which vary in the relationships they have established between school and the workplace, has also given rise to different research cultures in this field.

The development level and the importance of vocational training research vary from one country to another in terms of institutional and organisational frameworks and of content. In some countries it has been established as a separate field of university or non-university research, while in others it is a branch of educational research or a specialised subject within the broad domain of economic and social research; it can sometimes be assigned to a specific technological discipline or business sector which is of prime importance to the national economy in question.

In general terms, great importance is likely to attach to the status of education and vocational training research among the economic and social sciences in each country and to national traditions in the field of economic and social science. In the case of vocational training research, for instance, the question will be whether the wider picture is emphasised, with research focused on the economics of education and general structural issues, or whether a more microcosmic tradition prevails, with the emphasis on issues such as education strategies and teaching methods. What is quite vital is whether there is a highly developed system of teacher training for teachers and instructors on the staff of vocational colleges or companies and whether such teacher training is based in colleges of education and universities or only in technical colleges or technical training centres.

In addition, this field of research is mostly interdisciplinary in nature. The status of vocational training research in a given country can also depend heavily on the scope of this interdiscipline, in other words the extent to which the research incorporates neighbouring disciplines. It is also crucially important, of course, whether the Member State in question provides funds and staffing through the executive branch of government or through related agencies and/or public support bodies.

Besides the purely academic dimension and the aspects specific to the integration process, the future success of European vocational training research will depend on whether it asserts itself as an efficient interdisciplinary science with its own procedural and instructional methodology, a science that is attuned to the increasing importance of specialised skills and vocational qualifications and to the ever greater role played by job-related and subject-related knowledge in the context of new production processes and organisational systems. Accordingly, staff development will have to be at the forefront of this research, since increasingly service-orientated and customer-centred business activities, along with fast-changing production cycles and rising quality standards, make staff development a key factor in the European economy (see, for example, the contribution to this volume by Barry Nyhan).

3. Ideas for a European research strategy

3.1. 'National' research traditions and 'system-based' thinking

A European research strategy is supranational by nature. As experience of international research cooperation has shown, the development of supranational approaches to vocational training research is faced with the following major dilemma: on the one hand, answers have to be found to questions that do not arise solely from the domestic need for reform of a national system of vocational education or from other political, social or economic needs of a nation, and on the other hand much of the logic of this science is shaped by its applicability to one specific national education system. The comprehension problems that arise in every supranational vocational training project testify to the difficulty of switching from the tradition of a single vocational training culture which is even reflected in the national language to the world of ideas encapsulated in a vocational training culture based on different traditions.

Just as the various systems of vocational training were each determined by different philosophies of government and education when liberal constitutional States took shape, most of the theories in the realm of vocational training research in Europe are inextricably entwined around a national system of vocational education. In relation to the development of a European scientific community, it is important to examine the diverse geneses of the systems of vocational training and the ways in which these systems and the political, philosophical and academic traditions within which they have developed have influenced each other. This would construct a more stable basis, and above all a common basis, for supranational approaches to vocational training research.

3.2. The importance of national and regional education and vocational training cultures in the research context

The first stage of European cooperation in the field of education was dominated by comparative examination of the various systems of education and vocational training, based to some extent on a detached bird's-eye view, designed to create better understanding of their structures and their institutional and social organisation. It became clear at that stage that the differences between systems had far less bearing on the specific national character of vocational training than the differences in vocational training cultures.

These different cultures are determined by the relationships between theory and practice, learning and working, learning and non-working, work and leisure and occupational identity and flexibility. The various approaches to vocational training research are decisively influenced by these elements of the national or regional vocational training culture (6). While it may still be conceivable that individual elements of vocational training systems could be exchanged between countries – and indeed there have evidently been some successful experiments involving such transfers – cultural identities and the various vocational training philosophies set distinct limits on these exchanges. As far as vocational training research is concerned, for example, recurrent difficulties emerge in every supranational project when it comes to translating key terms such as the German words *Beruf* (English: profession, trade, vocation or occupation), *Ausbildung* (training, instruction or course of training/instruction), *Bildung* (education, training or course of education/training) or the apparently simple term *Qualifikation* (qualification, training level, skill or aptitude), all of which demonstrate the extent to which educational concepts are rooted in a specific culture.

Scientific study of the genesis of vocational training cultures in Europe and of their contribution to the efficiency of vocational training systems in promoting social, organisational and technological innovation processes in the industrial and service sectors thus assumes top priority in present-day European vocational training research. Deeper knowledge of other vocational training cultures would lead to better understanding of the conceptual basis of each system and would provide an indispensable aid to future supranational research and pilot projects.

3.3. In search of a balance between national/regional culture and European identity

The need to emphasise cultural identity in the various systems of vocational training derives from the elementary conditions of the European unification process. It seems right and proper that vocational training researchers should regard culture as the most important factor when studying the various systems of vocational training in Europe.

Be that as it may, the clash of national and regional cultures in the field of vocational education should not blind researchers to the common features that do exist. These also have historical roots, although they have tended to develop from disputes rather than cooperation between neighbouring States. Today, however, they have assumed a new dimension in the form of a wide range of practical challenges with which a politically and socially uniting and an economically largely united Europe confronts the systems of vocational training.

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(6) The seventh FORUM workshop dealt with the cultural dimension of vocational training. One of its conclusions was that analysis of the various vocational-training cultures and the development of an appropriate multicultural research strategy are among the main European vocational-training research priorities.

Internationally active companies in particular can tell us a thing or two about common features and about cultural differences that exist in practice in the realm of vocational training. Research into their experiences of these similarities and differences would be helpful as a means of finding the right cultural balance as a methodological basis for supranational research. There seems to be less and less to be gained from studying vocational training phenomena from a national perspective alone, e.g. from considering other countries' systems by reference to the German dual system of theoretical and practical training. The flexibility that is demanded of vocational training systems is also a desideratum of research in this field if the transition to supranational and multicultural research activities within the European Union is to be accomplished successfully. That is why it is absolutely imperative that researchers should be open to the common challenges facing all of the diverse vocational training systems. The increasing demands on European employees in terms of occupational skills and formal qualifications will feature prominently among these challenges. What is certainly needed is a theoretical approach which transcends nationally and culturally-restricted perspectives.

The mission of 'European' vocational training research is therefore to develop a separate research culture in which it is possible to preserve and consolidate the system- and culture-based logic that prevails in a given Member State while developing a transcendent 'European dimension', in other words to combine specific national approaches to research with a European perspective designed to promote joint development and cooperation. Above all, this implies a need to develop and improve supranational research methods which seek from the outset to follow the multicultural approach required for joint projects and which permit the formulation of working hypotheses in which the best possible balance is struck between these two perspectives.

3.4. From comparative to 'collaborative' vocational training research

If a European vocational training research strategy is to be developed, one priority requirement is the abandonment of the somewhat contemplative comparative research that used to predominate in favour of an approach that we shall call 'collaborative'.

It is obvious that the methodology of a supranational or, to be more precise, European form of vocational training research can be developed only in harmony with the state of European political integration. Political integration is the basis, framework and benchmark of developments in almost all political subsystems, including research, in so far as it is conducted at Community level.

The following identification of five stages of integration and the supranational research methods corresponding to each is intended to highlight the need to effect a transition to a concept of research based on a common European policy:

stage 1: descriptive observation of elements of various vocational training systems;
stage 2: comparison of the vocational training systems;
stage 3: comparison of the responses of various vocational training systems to problems of a supranational nature;
stage 4: collaborative development of national strategies for the solution of supranational problems;
stage 5: cooperative development of supranational strategies for the solution of supranational problems and implementation of these solutions at national/regional levels as well as in the framework of EU-wide activities.

If consideration is given to the future development of European integration, it is evident that the contemplative comparative approach (stages 1 to 3) will no longer meet the needs of European vocational training research once that research entails a cooperative quest for practical and innovative solutions to problems of common importance.

The proposed concept of 'collaborative' supranational vocational training research, in which generally relevant cross-system and practical questions form the basis of joint research activities, affects all the main methodological elements of vocational training research. However, we are not suggesting that comparisons should be outlawed. On the contrary, it remains an important task of the researcher to identify carefully the differences and comparable elements in the various systems and to take full account of these in the search for transferable solutions to common problems. The type of comparison that is important here, however, differs significantly from formal comparison of the facts and figures of vocational training systems, which begins and ends with the identification of common features and differences. Our comparison must focus more sharply on the basic conditions that underlie the formal differences, giving special consideration to the cultures, inherited attitudes and behaviour patterns of the various players, etc.

It is of fundamental importance when applying a European vocational-education research strategy that we develop the methodological elements of a supranational and cooperative approach into a usable toolkit for researchers.

3.5. Applied research and the development of innovations

In the field of vocational training, research necessarily bears a close relation to practice. Such a research strategy, combined with a strong emphasis on applications and technology and with technological aids which shorten the process of acquiring knowledge, will inevitably influence research findings. Given repeated emphasis by clients of their need for application-based vocational training research and the manifest aversion to academic or basic research, there is an observable tendency to regard vocational training research as a 'just-in-time' production facility designed to churn out a sort of 'operator's manual'. This type of applied research, which has been dominating the field, is not likely to come up with adequate solutions to more complex problems with longer-term implications or to provide the instruments and methods with which such solutions can be sought.

It is pertinent to recall that the same Leonardo da Vinci who gave his name to the EU vocational training programme – designed to serve, among other things – as an experimental laboratory – confronted and fascinated the world with new ideas through his sketches, written explanations and models of all sorts of items which were of no use to the society of his time. Many of Leonardo's ideas have since become part and parcel of our daily lives. Who would have thought that in his day?

But far be it from us to seek to alter the application-based nature of vocational training research; realism and practical relevance will continue to be the guiding principles and quality criteria in this research field. However, all players – not least funders and end-users – must be aware that an excessively narrow focus on applications and the release of innovation potential with sustainable effects in the longer term will tend to be mutually exclusive. Research in the fields of education and social science which focus – as is normal in the domain of engineering courses and qualifications, for example – on an isolated problem, without considering the complex web of associated factors that will always exist and the temporal dimension, is seldom innovative and, given its basic requirements in terms of funding and personnel, is actually almost impossible to justify.

At the same time, there are certainly ways of avoiding an excessively narrow interpretation of the practical and application-related nature of vocational training research and consequently of avoiding an adverse effect on its innovative potential. The efforts and resources put into education and vocational training research have been increased in the more recent European programmes Socrates and LDV (7) and in the fourth framework programme for research and technological development; it is therefore fundamentally possible to develop new scientifically based concepts and ideas. With the existing and foreseeable resources for the promotion of research, it will be possible to encourage many necessary innovations in vocational education on an EU scale and in the Member States.

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(7) EU vocational-training programme Leonardo da Vinci

The European Commission proposals on the sequel to the LDV programme (Leonardo II) reveal welcome signs of a realignment in the direction of better-equipped vocational training research, including for example the promotion of research networks designed to continue over longer periods of time.

4. Dimensions of a European policy on vocational training research

4.1. Fruitful divergences

Many people, especially those who are committed to European integration, find it hard to understand why the politically, historically and culturally-rooted differences between systems and institutions have to be regarded as conducive to the development of vocational training in Europe and of research in that field.

What is most needed is a coordination process, which has a vast range of practical and substantive advantages but must not be understood and abused as an instrument of harmonisation. Within such a coordination process, joint efforts can bring the various existing approaches to fruition. In the first instance that will only be possible if a certain self-discipline is exercised, confining the joint effort to the most important arrangements, which are largely organisational in character but are naturally inconceivable without reference to the substance of the research. This is best illustrated by concrete examples that have occurred in vocational training research at the European level.

4.1.1. Thematic networks

Within the targeted socioeconomic research (TSER) programme, which is described below, and in the framework of the activities of the European Centre for the Development of Vocational Training (Cedefop), for example in its work with Ciretoq (8), consideration has been given to the possibility of setting up and promoting thematic networks. These are designed to link various players from organisations, companies and research centres, as well as end-users, who have a common interest in a particular subject. Other aims are to facilitate the sharing of experience and knowledge, to increase the mobility of researchers and to meet the needs of political decision-makers more effectively. It also goes without saying that a thematic network is only eligible for support within the TSER programme if the project in question is obviously based on European partnership, in other words if the participation of several countries, or of institutions and individuals from several countries, is guaranteed.

As the name suggests, such a network is a subject-based form of cooperation. From what has been stated above, it may also be inferred that the aim of the network is to offer material that closely matches the practical needs of end-users and political decision-makers – which, as a matter of fact, ought to apply not only to such thematic networks but also to most other research activities.

The great advantage of this form of research organisation is that it provides the opportunity to tap into a greater wealth of scientific expertise and to concentrate it into subject areas, grouping it, as it were, around one or more subjects in a system comparable to that adopted by Cedefop with the Ciretoq network.

This organisational form makes it possible to increase the volume of European research as well as offering greater freedom of thematic emphasis and choice of methodology. If success can also be achieved in extending a thematic network to all Member States, which is the best-case scenario, it will be possible not only to bring together a huge pool of scientific knowledge and experience from many different vocational training and research cultures but also to achieve two other purposes of European research policy which were referred to above, namely coordination in the sense of a process of collaboration and exchanges on a given subject and cohesion in the sense of a form of common European research work that leads to convergence of standpoints and of methodological standards. The promotion and management of research can thus be more appropriately targeted and become more efficient, and duplicated effort can be avoided.

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(8) Ciretoq: Circle for Research Cooperation on European Trends in Occupations and Qualifications

4.1.2. The Forum for European Research in Vocational Education and Training

One of the thematic networks promoted by the TSER programme under the fourth EU framework programme for research and technological development is devoted to European vocational training research. The Forum for European Research in Vocational Education and Training currently has 23 members from 14 EU Member States and from vocational training research institutes and establishments. The Forum concentrates on the European dimension of the substance and methodology of vocational training research, with special emphasis on the typically European characteristics of vocational training. It also examines current developments which are liable to have an impact on vocational training throughout Europe. These include changes in the organisational and institutional framework, questions relating to the transition from school to work, in-house vocational training and the concept of the 'learning organisation'.

It is self-evident that the Forum, with its thematic focus on the European dimension of vocational training research, also touches on the key question that arises in connection with all Community activities in this research field: how does a study conducted by researchers from several European nations become a truly European piece of work?

The 'European dimension' is in constant need of definition, not least because it is interpreted in different ways, even within the scientific community. During the Forum's three-year development phase, we shall see whether a clear definition can be achieved and whether another aim, the establishment of a European research community in the field of vocational training, can be accomplished.

The agenda of the Forum, its multidisciplinary character and the fact that its membership covers almost all of the Member States make it well equipped to serve as a model, to demonstrate that thematic networks are a suitable means of achieving closer and sustained cooperation and coordination in the field of vocational training research at a European level.

However, it remains to be seen how broadly or narrowly research topics can best be defined in such networks. The Forum project is also expected to answer that question. It is conceivable, and could perhaps be highly profitable, to focus cooperative cross-border education and vocational training research on narrower subject areas but to combine or 'cluster' related subject areas, if only for practical reasons such as the research potential that could thus be tapped and the availability of researchers at particular times.

4.2. The European dimension and European integration

The foregoing remarks on the development of a supranational cooperative research strategy against the background of diverse vocational training systems and research cultures highlight the fact that developments in the field of European vocational training research are inextricably linked to the policy of European integration. That is the basis on which procedural methods and specific tasks are determined. In other words, the 'European dimension' that features as a *sine qua non* of European support in every call for tenders issued by the Commission under this programme represents a commitment to the integration process.

This should also be understood by the Member States as a reminder that they too ought to place greater emphasis on European integration in their own research activities in the field of vocational training, if only by exchanging information. For the European institutions, especially the European Commission, Cedefop and the European Training Foundation in Turin, this means that promotion of the closest possible cooperation among all the States of Europe goes hand in hand with the promotion of European vocational training research.

That, however, is not simply a matter of money and of willingness to cooperate. It also implies the fulfilment of organisational and substantive conditions in terms of cooperation mechanisms on the Commission side and standards governing this field of research in the individual countries.

The latter point touches on one of the guiding principles of general policy on European integration: achieving and strengthening cohesion and solidarity should also be a goal of European vocational training research.

Let us also borrow from the language of the official documentation to illustrate what vocational training research on a European scale is intended to achieve in terms of integration and cohesion. For the first time in the history of the Community framework programmes for research and technological development, the fourth framework programme, covering the period from 1994 to 1998, includes a specific programme in the field of socioeconomic research (targeted socioeconomic research (TSER) programme), one of the priority areas of which is research into general education and vocational training (area 2 of the programme) (⁹). One of the points made in the Council Decision relating to this programme is that a Community research activity is warranted if the planned research will help to strengthen the economic and social cohesion of the Community and to promote its general harmonious development.

This is another important guiding principle of the TSER programme, alongside others such as the aim of contributing to growth, competitiveness and employment. Vocational training research under the TSER programme, but not only there, must be governed by the aims of cohesion and the harmonious development of the Community. In programmes for the promotion of vocational training research, and indeed in every research activity at the Community level – and logically therefore in every single project – integration and cohesion are primary criteria. The aim of the following section is to show which organisational forms assume key importance in the quest for integration and cohesion.

4.3. Organisational forms at the Community level

When we deal with European vocational training research, we are dealing with a strategic task which will serve to strengthen the Community. Cooperation is therefore of over-riding importance. The questions to be asked are these: what opportunities for cooperation are there, and which forms of cooperation are likely to prove most successful and can serve as the basis for a joint research strategy in the field of vocational training? An analysis of the prospects and requirements for future research activities in the Community framework must precede these enquiries.

There are numerous national and international institutions and associations which already perform sterling work – and in some cases have been doing so for years – in the field of education and educational research, especially comparative educational research; one need only flick through the pages of the Cedefop *European Research Directory*. As far as Community-sponsored vocational training research institutions are concerned, Cedefop is the main reference body, entrusted with the specific mission of helping to advance and coordinate research in the field of vocational training at the European level.

There are other European activities in the field of vocational training research, activities which are largely limited in terms of subject-matter and tend to be closely modelled on pilot projects under the Leonardo da Vinci programme and on studies and analyses relating to such projects; these, however, have no specific organisational framework, if we disregard various coordination attempts by the Commission, the assistance of the Technical Bureau for the Leonardo programme (see the contribution to the present volume by Ant and Kintzele) and a certain degree of Cedefop involvement in these activities.

The TSER programme is a major new element in education and vocational training research at the European level, especially because it is de-

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(⁹) European Commission, TSER programme, work programmes for 1995–97.

signed to favour research with a more basic orientation. By the end of the programme period, 38 major educational-research projects will probably have benefited from TSER support. At the present time, about half of the assisted projects fall within the domain of vocational training research. This shows the importance which was attached to that research field in the three previous rounds of tendering and which is likely to be attached to it again during the current round.

The aforementioned diversity of subjects covered by vocational training research also applies to research in this field under the TSER programme. At the same time, in accordance with the tradition of Community research and the political orientation of the TSER programme, many research studies deal with the link between education and training on the one hand and work or the labour market on the other. The fight against unemployment and the promotion of employment have been the pre-eminent topics of European political debate in recent years.

An initial résumé reveals that many new developments have occurred in vocational training research at the Community level. The research projects have been absolutely exemplary in terms of staffing and resources; as for their scope, they have covered a wide range of subjects. Initial findings are available but are not yet detailed enough to permit a final evaluation. If we include the activities of Cedefop and more particularly the research conducted in individual Member States, most of which is relevant to other countries of the EU, the result is a rich fund of research in the field of vocational training. It must be said, however, that policymakers and providers of vocational education could still make better use of this fund of knowledge than has hitherto been the case.

In this situation, cooperation and coordination in pursuit of a European goal are all the more urgently needed. Only if cooperation is intensified can the eagerly sought-after synergetic effects be properly achieved. Moreover, and at a more elementary level, only through careful and targeted cooperation and coordination can research findings be made so fruitful that they will not be primarily applicable on an *ad hoc* basis within a restricted context or to a small number of players but will serve as a durable resource in the domain of vocational training policy as a whole and, above all, will do so throughout Europe.

4.4. Cooperation and coordination: the prerequisites of greater synergy

At first sight, cooperation seems to be the least of our problems. More and more international cooperation is taking place in all sorts of areas, not least in research. There is sound justification for engaging in it, because the difficulties facing the EU Member States are largely the same and because the investigation and successful resolution of these difficulties depends on full use being made of the entire research potential that is available in Europe.

However, there is something like a 'critical mass' in the research domain too; in the context of international research cooperation, this does not refer primarily to a particular quantity but to the gathering of potential from diverse sources. This is the key to the introduction of new perspectives and thus to the identification of new solution strategies which make it possible to overcome national limitations.

The various forms of cooperation differ in their level of intensity and particularly in their organisational safeguards. If the cooperation is to have a synergetic impact, it needs not only the strongest possible structure but above all a clear alignment to substantive goals. This inevitably leads to particular forms of coordination. How this coordination takes place, whether it be through largely voluntary agreements or within the framework of a strategy implemented by a single agency, depends on the political circumstances. In either case, coordination in Europe, especially in this domain, is a delicate process. That is why the coordination of European vocational training research, if it is to release synergetic effects through cooperation, must not imply some form of centrally / enforced standardisation.

4.5. Thematic and/or interdisciplinary clusters

This much can be said today of European-level research in the field of education and vocational training: the numerous cases in which a large number of internationally renowned institutes and researchers are working together on important issues represent only one side of the coin; for all the support provided under European programmes to research consortia, there is still a great deal of mutually exclusive and even freewheeling research. This emerges when, for example, various European authorities or organisations that are each promoting research projects in their own right assemble for joint meetings. Researchers and research teams who meet on such occasions frequently do not know each other, even though they are working in the same or closely / related fields.

So the task is to achieve improvements in the organisation of research cooperation in order to create a real synergetic impact. This task will become all the more urgent as European research in the fields of education and vocational training develops in quantity, quality and geographical scope.

Another aspect of cohesion is the need to marry the research potentials of the 'old' and 'new' Member States and to bridge the gap which persists to some extent between the research groups that already work together in a kind of common research culture and their colleagues on the periphery who have generally been frozen out of this system.

The fact that existing research potential needs to be pooled seems to go without saying; the arguments in favour of such pooling are irrefutable. Nevertheless, it is not easy to achieve real progress. In terms of synergy, cooperation makes sense only if thematic and interdisciplinary clusters can be formed. Only if researchers concentrate on a coherent topic, in other words on a subject area the content of which can be clearly circumscribed (and then only if they have sufficient time to deal with it) can an intensive and fruitful academic discussion be expected to materialise.

Encouraging and strengthening thematically-based cooperation in pursuit of goals with European relevance or in order to lend a European dimension to existing research is the most urgent requirement when it comes to organising research in the field of education and vocational training at the European level.

The formation of clusters thus achieves several strategically important objectives at once. Clustering requires prior agreement on the thematic and disciplinary focus of the research. This process is significant in itself, because it leads directly to a discussion on research priorities. In certain situations, clustering may thus be used as a means of clarifying the European research agenda and of determining which academic disciplines should play a part in specific vocational training research projects.

4.6. A common research agenda

How far-reaching this work on the research agenda can ultimately be, i.e. how clustering affects research planning strategy, depends on the organisation of the coordination process. This process is not just a matter of involving the relevant partners on the research side and from the European programme administration but should also include, wherever possible, representatives from the decision-making level, i.e. the 'end-users' or addressees of the studies. To link clustering in this way with an intensive and perhaps permanent process of coordinating the European education and vocational training research agenda is undoubtedly a difficult undertaking. If the task is mastered, a vast amount of powerful synergy can be released.

Clustering can also have a strategically significant impact on the research agenda if it is applied to the use, evaluation and exploitation of research findings. From the point of view of the European institutions and end-users, this imposes a task which is perhaps an even more urgent priority, not least in terms of cost-benefit considerations.

Research projects, especially those in the educational field, whether they be national or international, must perform two crucial tasks. One of these is inherent in the research and involves extending the existing frontiers of knowledge, while the other is political and involves improving the basis for policymaking in the realm of education and vocational training.

'Improving the knowledge base', as the official documents call it (10), means enhancing the state of the art in research terms, while in political terms it means providing scientifically-proven knowledge that can be used as a basis for planning and decision-making in the realm of education policy.

Transfer and dissemination processes thereby assume particular importance, not only within the scientific community but also between the worlds of science and politics. These transfer processes are not normally self-generating but require thorough organisation, with due regard to the special importance that attaches to user-orientation in vocational training research on account of the practical relevance of that field.

Improved dissemination and use of vocational training research findings is also a priority item on the European agenda. However, the great volume of new knowledge that emerges from studies and analyses conducted under various programmes provides an indication of the scope, importance and complexity of this task. The main requirement here is cooperation on the part of the sponsoring institutions and the scientific community as well as a single coordinating agency to put together what belongs together. In the dissemination of research findings for systematic clustering, it should be remembered that it is vitally important to make economical use of the limited time at the disposal of end-users and researchers.

When it comes to documenting and evaluating previous research findings and further developing the research agenda on the basis of such evaluations, research can play a major part, especially in the form of accompanying research. The same applies to the scientific accompaniment of pilot projects. In this context it is gratifying to note that the Commission proposals on Leonardo II provide for even closer links in the future between pilot projects and vocational training research.

5. Priorities for a future system of European vocational training research

A preview of future Community research in the field of vocational training inevitably reflects more hopes for the future than foreseeable achievements. The future scope and the form of European vocational training research at the Community level will ultimately depend on the political decisions of the European Council and Parliament on framework research programmes and action programmes.

The prospects for vocational training research in the European framework can surely be regarded as favourable, since this field of research is inextricably linked to political priorities at the national and Community levels: achieving greater economic efficiency, promoting employment, combating social exclusion and marginalisation and improving innovative potential. If the future prospects and the likely impact of vocational training research had to be focused on one single point, that key point would be the contribution it can make to improving the employment situation and the employability of the European population.

The question concerning the nature of European vocational training research has to be asked in the context of a politically important need to devote more attention to the link between vocational training and the labour market. It is not just a matter of establishing vocational training research throughout Europe as an integral part of the socioeconomic research structure and of lending it greater weight; it is also a question of examining the forms and methodology of research work in that field. Only if these grow in quality and credibility can vocational training research establish itself permanently as a research discipline.

Calls are being voiced in all quarters for scientific cross-border approaches, in other words for integrated research cooperation involving various disciplines. In the domain of vocational training research, however, interdisciplinary activity has a very special significance, for training systems cover many areas of interdependence: in the wider context there are connections with economic, technological and general sociopolitical processes and with national and, in some cases, globalised control processes; in the narrower context, there are issues such as organisational systems within companies, individual career patterns, knowledge-based processes and new social alignments of individuals and groups.

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(10) European Commission (DG XII): Project synopses relating to the first and second calls for the submission of project proposals.

Restricting work in this research field to questions of vocational training in the narrow sense is illogical, not only because of the manifold socioeconomic implications of vocational training. Those responsible for policy-making, planning and hence also research in the field of vocational training must never lose sight of the overriding link between education and work and must also take account of the lifelong timeframe. The fact is that every contemporary education-policy blueprint must cover not only schooling and initial job training but must also devote special attention to lifelong learning. It is now a widely recognised aim to treat general education in all types of school and college, university education, vocational training and the various forms of further education and training as a single entity and to base educational planning and education policies on the all-embracing principle of lifelong learning. At the level of the European Community too, lifelong learning is one of the main guiding principles of education policy.

There must be implications for vocational training research if education and vocational training are regarded as an intricately interconnected mechanism, the components of which have to be resynchronised with each other, and also, given the requirements of lifelong learning, as a continuum. The link between education and training processes and the interaction between different forms of learning and different learning environments will assume greater importance as time goes on. For that reason, it is likely that the remaining boundaries between the various disciplines in the field of educational research will become increasingly indistinct.

Desirable though it may be to intensify research into vocational training throughout Europe, it is just as important to focus more and more attention on the entire education and training system under the common umbrella of educational research. Researchers studying the school, university and vocational training systems must cooperate very closely so that scientifically-sound foundations can be laid for a comprehensive reform based on the principle of lifelong learning. The interdisciplinary approach is therefore an important precept in the field of educational research.

5.1. Preview of the new Community programmes

The latest developments in the updating of Community programmes underline the fact that vocational training research at the European level must henceforth be conceived within a wider thematic framework. It will take its bearings from the ideas of the 'knowledge-based society' and the 'European educational area'. The Commission communication we mentioned above, entitled *Towards a Europe of knowledge*, vigorously advocates systematic pursuit of the lifelong-learning approach as referred to in the Amsterdam Treaty. The communication emphasises the need for fuller integration of general education, vocational training and youth policies. This also challenges vocational training researchers to pay greater heed to integrative elements, i.e. the factors which transcend individual areas of the education system.

The research agenda in the field of European vocational training will be very largely determined in future by the process of European integration. We have already referred to the expressed intention of extending future programmes to all countries that are willing to join the European Union and of intensifying international cooperation in general.

Concentration on the main issues and integration of research topics under thematic headings are principles that will determine the proposals for the forthcoming fifth framework programme for research and technological development. The planned key action entitled *Improving the socioeconomic knowledge base*, which will replace the existing TSER programme, provides for four major subject areas, each of which is relevant in terms of education and vocational training research. These areas are as follows: 'social trends and structural change', 'technology, society and employment', 'governance and citizenship' and 'new development models to strengthen growth and employment' (¹¹).

This organisation of socioeconomic research into general thematic complexes means that all research projects, including those in the fields of education and vocational training, must address 'transverse' issues to a greater extent than in the fourth framework programme that will soon have run its course. As we emphasised above, this means that Community-level research into vocational training and qualifications is expected to contribute to the solution of problems of general relevance to the European integration process and to social and economic development in Europe. Interdisciplinary cooperation is likely to play a major role in such research.

5.2. European vocational training research as a regional innovation agency

We have already spoken of fruitful divergences between present researchers in Europe as well as about the main challenges and opportunities. The greatest research challenge posed by European integration is surely that of using cultural diversity to greater effect than hitherto as a source of new innovative ideas. This diversity encapsulates a vital innovative potential for Europe which, however, has seldom been realised or 'pushed'.

A great deal will depend in future on whether and how the problem of intercultural transfer can be solved. The foremost task is to turn jointly developed cross-cultural European strategies into practical solutions within the specific cultures and systems that exist at the local, regional and national levels.

Accordingly, the strategy of a European or at least supranational form of vocational training research should not only be pursued nationally but should also be established at local and regional levels, perhaps in the form of an 'innovation agency', which would coordinate transfers between the various players and establishments responsible for generating knowledge and would encourage the incorporation of such knowledge into system- and company-based innovations. These local and regional innovation agencies would primarily take their strategic orientation from European/supranational research, giving due consideration to the prevailing global challenges. In this way they would contribute to the political formation of a dialectical construct of cross-cultural ideas, to the adaptation of those ideas to regional conditions and to their implementation. This type of research strategy, combining the 'European dimension' with regional innovation requirements, could not only put greater emphasis on the diversity of vocational training and research cultures as sources of new ideas but might also help to overcome tensions that exist within the European integration process.

As far as our present subject is concerned, the end result would be a new European vocational training culture, in which specific national and regional features would form a fruitful blend with common European aims of understanding, cooperation and experience-sharing in the context of the ongoing development of cultural and social bonds. If that is achieved, a common European educational area and a social union, which must rank at the present time as a task for the future, could be brought a significant step closer to realisation.

6. Conclusions

The aims, methodology and organisational forms of European vocational training research are in urgent need of further development. The main need is for systematic steps away from the conventional style of rather contemplative comparative research towards a closer form of research cooperation which transcends the various different vocational training systems, towards a genuinely cooperative and collaborative type of research.

Vocational training research should be recognised in Europe as an important academic discipline in its own right, but due regard should

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(¹¹) Cf. European Commission, Proposals for European Parliament and Council Decisions concerning specific programmes for the implementation of the fifth framework programme of the European Community for research, technological development and demonstration activities (1998–2002). 1998.

also be paid to its interdisciplinary orientation. The fact that the principle of lifelong learning is now so widely accepted makes interaction among the various educational, economic and social research disciplines an even more urgent and inescapable necessity.

The development of a 'collaborative' European vocational training research strategy could help to create better understanding of the various cultures in which both the individual vocational training systems and the research traditions in the field of vocational training are embedded. If a fruitful link can be established between loyalty to these regional traditions and the practical challenges with which we are all faced today as the European integration process unfolds, the innovative potential of European vocational training research can be released to far greater effect than in the past.

Vocational training research at the EU level requires improved organisational forms and facilities, so that cooperation can be intensified and coordination strengthened and so that the desired synergetic effects can be created. The thematic grouping of research projects under particular headings, which we have referred to in this paper as 'clustering', is a priority requirement in our opinion. It could optimise the impact of existing research projects while helping to achieve more efficient dissemination of their results, thereby ensuring that better use is made of research findings. This could also be expected to augur well for the continuing conceptual development of the European agenda for vocational training research.

D. Strategies and scenarios for the development of (continuing) VET

Fons van Wieringen (¹)

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1. Changes in social environment and strategic responses

What changes are occurring in the social environment of vocational training and adult education and what strategies would provide an appropriate response to such changes? It would be very convenient if we knew the answer. Unfortunately we cannot foresee what changes the future will bring, we have no clear idea what strategic responses will be possible and we simply do not know whether those strategic responses will be adequate. Scenarios can be used to gain a better insight into the many uncertainties of the future. This does not make the uncertainties disappear, but it enables them to be given a name and connect them with other uncertainties and even, now and then, with some certainties. Drafting scenarios can make it easier for us to deal with potential future problems. Scenarios can be used to explore the future and sharpen vision, making it possible to see events as part of a greater whole and therefore to identify their implications more readily.

Can scenarios be explicitly incorporated in the process of formulating strategies? Scenarios can form a variety of contexts for strategies of vocational education and adult education. It is essential, however, to grasp the difference between a strategy and a scenario. Scenarios are an extremely useful tool for strategy formulation. Scenarios describe possible trends, whereas strategies present options for action in response to these potential developments. Scenarios provide a testing ground for strategies or, to put it another way, they are wind-tunnels in which different strategic options can be tested out. The aim is to work out various possible strategies within a set of different scenarios (van der Heijden 1996).

It is a question of elaborating different strategies within different scenarios. Every possible strategy can be translated into any scenario. The extent to which scenarios and strategies are handled in an integrated fashion may vary. A strategy which works well only in one scenario and in none of the others is certainly hazardous. Strategies indicate ways of dealing with different futures. An ensemble of scenarios can form a common framework for the development of a strategy that is more sensitive to changes in the social environment.

For each draft scenario it is possible to establish more important links than the number that have been worked out.

Scenarios must be drafted in a way that make them more or less equally probable. In designing strategies, it is therefore important not only to look for the most appropriate scenario, but to place the various strategy proposals in the context of the different scenarios. 'Wind-tunnelling' means using the various futures (scenarios) to provide test conditions that will reveal the strengths and weaknesses of each

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(¹) Universiteit van Amsterdam, Faculteit der Pedagogische en Onderwijskundige Wetenschappen.

of the possible strategies. For this reason, it is important that the various scenarios should be regarded as equal and be given a weight that equals that of test conditions.

To do justice to interactive developments, scenarios must satisfy a number of criteria:

- a scenario must be hypothetical; it must be based on unforeseen events, reactions to those events, and combinations of events;
- a scenario must have a pluralistic construction to enable comparison;
- a scenario must cover the entire time-span from present to future situations;
- a scenario is a sketch; it describes the main features and does not go into details. In addition, it indicates crucial moments of choice; the moments at which points for embarking on a different direction in the future are situated;
- a scenario is multi-faced and holistic: it relates to the interaction between developments and events or other kinds of discontinuities that may occur in the future.

Scenarios serve a number of purposes (van der Heijden 1996, Schoemaker 1995):

- they are useful in catering for changes which are hard to detect, they identify early warning signals;
- they help in the determination of the robustness of the qualities of vocational education and of the vocational education policy system;
- they help to instigate better strategic options;
- they assess the risk/profit profile of each strategic option in the light of uncertainties;
- they communicate messages within the system.

The scenarios and strategies can be used as tools to improve the understanding of vocational education and training systems and their social environments. The use of the scenarios and strategies in a 'strategic dialogue' can produce a better basis for the decision-making process.

An example to illustrate the construction of a scenario is the activity of the Dutch Central Planning Bureau that constructed three scenarios for the European economy. The Central Planning Bureau (1992) outlined three different scenarios for the period 1990–2015:

- global shift;
- balanced growth;
- European renaissance.

Global shift: shift of the centre of gravity to the Pacific Rim

The global shift scenario is characterised by dynamic technical developments (pp. 18ff.). Despite steps taken towards the widening and deepening of the internal market, generally speaking Europe appears to be ill prepared in the light of the innovatory force and competition released by the Asian-Pacific region. As a relatively small country, the Netherlands suffers to a comparatively large extent from a stagnating European integration and the continued existence of fragmented markets. This is occurring precisely during a period in which the Netherlands must restructure itself, moving from the specialisation in low-level processing industries, the energy sector and the agro-industrial complex towards high level, more knowledge-intensive segments of the market.

In the mid-1990s, the measures taken to reduce the volume of incapacity for work and absenteeism appear to have been effective on only a limited scale. With employment first stagnating and later even declining, the number of those incapable of working exceeds the 1.25 million mark after 2000. A policy of activating the labour market as a reaction to the growing unemployment reaches an impasse; the output from such programmes stagnates with the decline in employment, while the potential supply is large as a result of factors like high immigration. If there are no changes in income relations (between allowances and wages, and between minimum wage and average wage), the hard core of unemployment grows. The labour market becomes more and more dual, so that increases in the collective burden can be deflected despite the high rate of unemployment. The public sector bears a heavy financial and administrative burden. Unemployment and high immigration lead to extra expenditure on social security, council housing and rent subsidy; public expenditure in 2005 is 10 % higher than in 1990. If the total of unemployed and incapacitated for work reaches 2 million by about 2005, the result will be a shock effect and an acute awareness that rigorous changes are necessary to put an end to lagging behind the growth of prosperity of Japan, the dynamic Asian economies and the US. From 2005 on, tough measures are taken to tackle the rigidities on the commodities and labour market. These measures are in line with the so-called free market perspective that in this scenario appears to be so successful around the Pacific Rim. Because the response is late and the seriousness of the problems has grown, these measures inevitably have a rough and ready character. The average and marginal burden is reduced by means of drastic changes in the public sector, such as generic reductions in social benefits.

Balanced growth: towards a sustainable, multipolar growth

The balanced growth scenario outlines a world with a strong, multipolar economic growth, in which important progress is also made in view of an ecologically sustainable development (pp. 19ff). The successful participation of western Europe and the Netherlands in this development calls for a stronger role for the market and stronger incentive structures, especially on the labour and commodity markets. At the national level these international developments lead to a strong shift in emphasis towards the free market perspective and a redefinition of the role of the government. The government encourages dynamism and efficiency by promoting the role of the market and of competition. Cutting back on regulations, hiving off tasks and increasing efficiency in public administration and spending less on defence create the scope for a more ample fulfilment of the classical tasks of the State in the field of education and infrastructure. The tax system is fundamentally reviewed to promote a more market-orientated allocation of savings. The government applies regulatory levies in the field of energy, mobility and the environment. The sociocultural development, with increasingly vociferous and calculating citizens and the functioning of the labour market, combined with the intensification of international (policy) competition, make a fundamental review of the welfare State essential. Social security schemes become more austere. There is an individualised basic facility by means of a system of negative income tax, which exerts a positive influence on labour participation. The sharp reduction in the share of public expenditure as a percentage of national income enables the introduction of this system. The minimum wage is abolished. A much more individualised and flexible pension scheme is set up. Incentives for cost management are introduced in the welfare sector.

European renaissance: new opportunities for Europe

The technological development is less dynamic and more gradual in the European renaissance scenario than in the global shift scenario. Very sizeable investments in R & D are required, with large-scale risks and uncertainties (pp. 21ff.). Western Europe develops favourably in this scenario. European integration means a shift of emphasis towards the free market perspective for the European markets of commodities and services. Moreover, there is a revitalisation and renewal of the coordination perspective (i.e. coordination at macro level can promote economic development) in the field of the labour market, the welfare State and in public administration.

Many tasks of government shift to the European level in European Renaissance. Under the influence of the coordination perspective, the responsibility for the contents of policy and for finance in the field of the labour market and the welfare State shifts drastically to the lower levels of government and executive organisations. This scenario too emphasises the improvement of the quality of education if the Netherlands is to remain an attractive site for knowledge-intensive productive activities. In the restructuring of the welfare State there is a strong shift in emphasis from a (passive) guarantee of income during periods of inactivity to an active and activating labour market policy. A tripartite social consensus and cooperation emerges, one of whose aims is to deploy those with a low level of education in the labour process, with a clear-cut division of responsibilities between government bodies and social partners. This policy is supported by moderate cuts in labour market related benefits and by a reinforcement of financial incentives. The volume of incapacity for work and absenteeism is reduced to bring the collective burden closer to the European average. The surcharge for single wage earners in the tax system is abolished to promote participation in employment.

These scenarios are clear and easy to grasp. They have, however, a major methodological disadvantage. Environmental scenarios and policy scenarios overlap in these scenarios. It is more attractive to maintain the distinction between environment and policy.

2. Methods for the devising of scenarios

There is no fixed method for devising scenarios, but various steps have been taken in this direction. Schoemaker (1992) distinguishes the following stages:

- Determination of the range, for example the time-span.
- Determination of the major stakeholders, such as resource suppliers, employers, customers, competitors, allies, regulators and supervisors.
- Identification of basic trends in the environments.
- Identification of key uncertainties: what events, whose outcomes are uncertain will significantly affect the issues of the vocational and educational training sector? Next we want to identify relationships among those uncertainties about the future environment of vocational and educational training.
- Construction of the initial scenario themes: the various outcomes are arranged in terms of continuity, level of preparedness, and turbulence. Select the two major uncertainties. Place the positive and negative outcomes of the uncertainties in different scenarios to obtain the extremes and add a middle-of-the-road scenario.
- Check for consistency and plausibility: are the trends compatible with the chosen time-span? Do the scenarios combine outcomes which can logically be combined? Are the major stakeholders placed in a position that they find unattractive and can change? If so, try a different scenario that is more stable.
- Develop learning scenarios: general themes emerge from the simple scenarios and from checking them.
- Identify research needs.
- Develop quantitative models.
- Think up decision-orientated scenarios: are the scenarios relevant? Are the scenarios internally consistent? Are they archetypal, do they present generically different futures rather than variations on a theme? Does each scenario provide a situation in which the system can continue to exist for a longer period?

On the basis of years of practical experience with scenarios for Royal Dutch/Shell, van der Heijden (1996) provides a number of instruments to help in the development of scenarios:

- classification of variables as predetermined and uncertain;
- identification of patterns and trends in events;
- arrangement of variables on the basis of importance and predictability;
- research on what makes a fundamental difference for the client;
- practical aids for linking and grouping concepts, such as magnetic hexagons;
- causal diagrams and computer resources to handle them efficiently.

A commonly used method in the construction of scenarios is the structured consultation of experts. One way of doing this is by means of a questionnaire. These questionnaires concern a particular subject and are filled in by experts selected for the research. If there is a second or third round, the experts receive a summary of the results of the previous round, including a statistical indication of the group responses and of the degree of consensus.

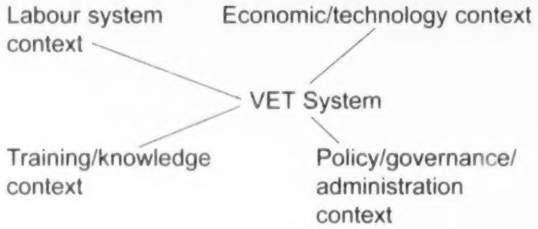
The project resulting in the scenarios and strategies for vocational and adult education was phased as follows:

- collection of data on trends in the system of vocational and adult education;
- collection of data on trends in four designated social environments;
- identification of approximately 300 relevant experts, drawn from all the different social and economic environments;
- initial round of questionnaires to experts on environments;
- seminar for policy-makers based on results of initial questionnaire;
- seminar for experts on environments, based on results of initial questionnaire;
- second questionnaire (environments together);
- separate round of questionnaires to experts on policy/administration environment;
- development of dimensions for scenarios and strategies and initial draft of scenarios and strategies;
- seminar for policy-makers; further elaboration of scenarios and strategies;
- seminar for experts on environments; further elaboration of scenarios and strategies;
- final draft text of scenarios and strategies;
- scenario workshop for broad-based group of social experts and policy-makers.

3. Four social environments

In order to develop scenarios and trends for vocational and adult education trends affecting the system of vocational and adult education were broken down into a number of different social and economic environments. Four of these were selected for further study and inclusion in the project. They were designated 'the labour system', 'the economic/technological environment', 'the training/knowledge environment' and, finally, 'the policy/administrative environment'. The first two terms require little explanation. The training/knowledge environment is based on the assumption that the system of vocational and adult education operates in a world where training and knowledge are widespread and influence education. The policy/administration environment has been included because policy-making is an essential context for the development of the system of vocational and adult education. From the point of view of the system, policy/administration is an obvious social environment.

Diagram 1
The four selected contexts


Labour system context
Economic/technology context
VET System
Training/knowledge context
Policy/governance/ administration context

4. Selection of trends

Some 100 trends are collected which various experts rate as important for developments in the vocational education and adult education environment. We reduced these 100 to approximately 50 trends. We then presented them to groups of experts from each of the four environments, each comprising some 70 individuals.

What is a trend? We have used five criteria for the further specification of trends:

- a trend is potentially or actually active, it leads to more than marginal changes;
- a trend is discrete and capable of being delimited;
- a trend is persistent;
- a trend has a network of experts with a minimal level of organisation and reporting on the trend;
- a trend has a recognised or suspected important connection with the education and/or training system.

The fifth criterion is necessary because it is not the intention to develop scenarios for the economy in general, for example. Scenarios of that kind are already available. What matters here is to formulate the educational facets of general trends. Even after these criteria have been applied, the problem remains that it is difficult to make a pronouncement on the comparability of the trends. We used reductive techniques to arrive at a smaller number of trends which are probably more comparable with one another.

A selection was made of some 50 trends regarded by various experts as important factors shaping the social and economic environment of vocational training and adult education.

These include, for example:

- greater flexibility
- the ageing population
- increasing importance of labour mobility and training
- industry's increasing willingness to contribute to education
- selective participation in training
- growing knowledge intensity
- increasing use of technology as an economic instrument
- technology and internationalisation
- changing structure of employment
- increasing importance of regional structures.

These 50 trends were presented to groups, each of about 70 experts. This meant that experts on each of the environments were presented with a set of around 20 trends and that the set of questions differed from one environment to another.

5. Expert consultation

In view of the selection of experts we have observed the following criteria:

- assumed expertise in the field of environmental changes that may be of importance for vocational education and adult education;
- assumed expertise in the field of macro determinants, particularly the labour market and technological developments, in relation to vocational education and adult education;
- assumed the capacity to formulate motivations concerning future developments that are relevant for vocational education and adult education, including firm-based training courses;
- selection from government circles, the world of vocational education, firm-based training courses, employees, employers and the academic world;
- the participants must be able to grasp the changes within their field and have a clear picture of what those changes mean for their organisation.

Experts were sought in the following circles: industry (branch) organisations; employers' organisations and trades unions; chairpersons/managers of the 25 largest branch organisations in the Netherlands; research and planning divisions of SMEs; research bureaux attached to independent or semi-independent foundations, universities and research institutions; professors of strategy, corporate development, economic development, labour organisation, adult education, secondary vocational education, higher vocational education; editors of relevant journals; public bodies responsible for vocational training/adult education departments of educational support institutions; officials of the EU, Cedefop (Thessaloniki), ETF (Turin), ILO (Geneva), Leonardo da Vinci programme officers and BIBB (Berlin/Bonn); senior consultants in specialist divisions of management consultants firms; executive boards of regional training centres and colleges of higher professional education; members of the Higher Professional Education Council and the Vocational and Adult Education Council; directors, deputy directors, and heads of department/senior members of the Adult Vocational Education and Higher Vocational Education Boards of the Ministry of Education, Culture and Science; members of the Education–Industry Committee for Apprenticeship Systems and directors of training institutions in the private sector, etc.

A total of 228 experts from the environments of labour and employment, economy and technology, and training and knowledge were approached during the first round of the written questionnaire.

Experts from the fourth environment, i.e. policy and administration, were approached in a different way: they were questioned only once. Of the 228 experts, 108 filled in and returned the questionnaires (n=108). The average response was 47 %.

Forty-eight per cent of the total group of respondents work in the private sector and 42 % in the public sector. Ten per cent of the respondents work in both sectors. Many of the respondents are involved in the education sector via an employers' or employees' organisation (28 %). More than one fifth (21 %) of the total respondent group are female and 79 % are male. Eighty-five per cent of the entire group are 40 years of age or older.

Table 1 Survey of response in the different environmental expert groups

Environment	Approached	Response	Response percentage
economy/ technology	67	32	48
employment	71	26	37
training/ knowledge	90	50	56
Total	228	108	47

The employment environment appeared to be on the low side in relation to the total response. The total response in the first round was satisfactory. A great deal was expected from the respondents: to be able to interpret a trend, apply it to a variety of situations and, finally, motivate the positions indicated by the respondents themselves.

The 108 respondents who had already been involved in the first round were then approached with the second written questionnaire. This resulted in a response of 65 %. The division of the respondents over the private and the public sector in this round is even (43 % each), while 13 % work in both sectors. A large number of respondents were selected from an employers' or an employees' organisation, or were connected with (one of) the educational sectors through research and/or study. Almost one third (30 %) of the total group of respondents in this round is female and more than two thirds (70 %) are male. More than 90 % of the respondents are 40 years of age or older.

In addition to the written questionnaires, small-scale seminars were organised: one with policy-makers and one with experts. Policy-makers were selected from the Adult Vocational Education and Higher Vocational Education Boards of the Ministry of Education, Culture and Science and from the Adult Vocational Education Council and the Higher Vocational Education Council. The group of experts was drawn from the private education sector or from the environmental segments concerned.

Each of the expert groups was presented with 20 trends and was asked to rate them in terms of (un)certainty and (un)importance. Five trends were common to all three groups of experts and the remainder were different for each group. The groups were also asked to explain the reasons for their replies.

The common trends identified on this basis were:

- increasing individual responsibility for training
- growing importance of specialisation
- continued importance of schools for lower social groups
- strengthening of the relation of vocational education and adult education to other knowledge institutions
- growing importance of tax facilities for training.

The three groups of different trends were:

Economic and technological environment

- Must training courses be made more general now that employment is changing so fast?
- Do higher vocational education and adult vocational education share in the responsibility for economic innovations?
- Increasing importance of branch organisations.
- Position of higher vocational education and adult vocational education with regard to national branches and regional industry.
- Higher vocational education and adult vocational education and the emergence of new companies.

- Education as a basic condition of technical and social acceptance of technology?
- Division of responsibility: functionally orientated training for industry?
- Is training gaining ground rapidly in collective labour agreements?
- Can education help create an interactive structure?
- Can the export sensitivity of the Regional Training Centres and polytechnics be strengthened?
- New combinations of industry and services.
- Further dissemination of the results of R & D.
- Ageing and reduced supply of freshly qualified personnel.
- Funding variants of education.

Labour organisation environment

- Only training for the permanent core?
- Do training courses make social cohesion more important?
- Continuing government role?
- Other labour organisation, other training?
- Labour market selection criteria: position of groups that lag behind?
- Division of responsibility: functionally orientated training for industry?
- Is training gaining ground rapidly in collective labour agreements?
- Ageing and reduced supply of freshly qualified personnel?
- Permanent disadvantage for those with a low level of education?
- Training for the unemployed instead of supplementary benefits?
- Flexible alternation of periods of work and caring/training?
- Recognition of functions at low level?
- Firm combination of work and learning for migrants?
- Must training courses be made more general now that employment is changing so fast?
- More attention to (beginning) entrepreneur skills?

Training and knowledge environment

- Changing position of higher vocational education and adult vocational education because of the growth of training courses elsewhere?
- High basic qualifications, high standard of living?
- Are training courses organised by the branches gaining in importance?
- Does industry invest less in those with a lower level of education?
- Will the older generation have to follow more training?
- Is it primarily the technical training courses which are a matter for concern?
- Attention to entrepreneur skills?
- Training as offensive strategy?
- Special demands on training courses for groups that are difficult to place?
- Declining importance of the school because of information technology?
- Are schools in fact the right place for information technology?
- Are tutors in higher vocational and adult vocational education equivalent to other professions in the information sector?
- Strengthening of the links between higher vocational education and adult vocational education and the branches?
- Adult vocational education as an interface between higher vocational education and medium-sized and small companies.
- Information technology as a competitor?

The analysis of the first round was aimed at providing an empirically reliable and theoretically meaningful reduction of the approximately 50 trends. Factor analysis was carried out for each group of respondents in combination with homogeneity analysis of the resulting factors. We found eight factors in each environment after the first round. These eight factors cover 20 of the almost 50 original trends. These factors are the following trends (a to h):

Economic and technological trends

a) companies and education
b) interaction between companies and education

Labour market trends

c) lifelong capacity for work
d) work through training for the future (specialisation versus generalisation)
e) individualisation and cohesion

Training and knowledge trends

f) ICT as a competition booster
g) continuing social responsibility of education
h) sharper distinction between State-funded and private education

6. From the eight factors (including 20 trends) to scenario dimensions

The 20 trends linked with these eight factors were presented to the respondents during the second round. As mentioned above, 108 experts were approached, and the response was 65 %.

Variants of factor analysis of the 20 statements or selections of statements and homogeneity analysis yielded a number of scenario dimensions that are relevant for scenario construction.

We present here the five dimensions with the environmental segment(s) concerned.

(i) economy and technology environment:
dependence of economy on knowledge interaction structure;
(ii) employment environment:
working life (employment-training-care) cycle/alternation;
(iii) economy and technology/employment environment:
decreasing company responsibility for educational investment;
(iv) employment/education and knowledge environment:
difficult to place/migrants;
(v) education and knowledge environment:
education outside the school/the school under threat/ICT competitors.

We used the first two dimensions for the construction of initial scenarios. These two main factors which emerged from the analysis of the second questionnaire were used as dimensions for the scenario model: 'economic dependence on knowledge interaction structure' became the horizontal axis and 'flexible periods of working, caring and training' the vertical one.

Based on this model, four social scenarios were constructed with the following titles:

1 The aloof society

Scenario: Social and economic developments demand a realistic use of education. No significant contribution to post-initial phase.

2 The dual society

Scenario: High but divergent expectations of both initial and post-initial education.

3 The secure society

Scenario: Safeguarding skills: educational security alongside social security.

4 The pick-'n'-mix society

Scenario: Varying expectations of education.

Social scenario 1: The aloof society

Society ascribes to the education system a powerful role in the initial phase. Beyond this, however, it sees no significant role for education in social, economic or technological development. This is not seen as part of the education system's core business. Bodies like companies, industry organisations and social

Diagram 2
The four scenarios

	Dependence of the economy on knowledge interaction structure low	 high
Flexible stages of working, caring and learning Weakly developed	the aloof society	the dual society
Flexible stages of working, caring and learning Strongly developed	the secure society	the pick-'n'-mix society

security agencies are quite capable of providing the necessary specialist knowledge and expertise for themselves. Demanding this sort of contribution from the education system would jeopardise its basic functions. Business and social organisations are clear about what they want from the education system. It should provide a firm foundation for individuals to play their part in society and in the world of work. They see the establishment of this foundation as the core business of education. In their eyes, it is a difficult enough task to do this successfully and it is not sensible or realistic to expect education to do anything else.

Vocational education is expected to deliver high-calibre basic training to equip young people with a solid basis for their further personal and professional development within society.

Nothing is expected of the education system with regard to social developments such as the combination of work, learning and care responsibilities. In this scenario, the increasing flexibility of the pension system and differentiation in social security arrangements aimed at permitting career breaks and a better distribution of work throughout life have negligible consequences for education.

Government regards initial vocational training as a form of basic social provision for which it must be responsible and which it therefore funds. It regards it as very important that this form of education should provide the best possible opportunities for underprivileged groups, enabling them too to enter the labour market with the highest possible initial qualifications. This approach also helps to increase the numbers of skilled staff entering the labour market. In addition, there is a strong focus within initial vocational education on first- and second-generation immigrants, an important reservoir of future manpower.

Further training for those in work is regarded as the responsibility of individual workers and their companies. Employers invest more in workers if they think training is likely to pay dividends, and therefore more in younger skilled workers with some years of experience and in managers. This means that little training tends to be offered to groups such as the low-skilled, older workers and first- and second-generation immigrants.

Social scenario 2: The dual society

Society has two separate sets of expectations regarding the education system. It expects a proper foundation and at the same time active participation in setting up training courses to reflect specific developments in the workplace. These two sets of expectations are not put to the education system in an integrated way. It is up to institutions to devise an adequate organisational structure to cope with these developments.

Individual companies and industries are very alert to changes in their skill requirements and very ready to call on the education system to provide these skills. Society expects higher professional education and the adult education and training fields to play their part by setting up regional networks with SMEs and by delivering young talent with the knowledge and skills required by the local labour market. The education system is also expected to contribute to the local economy, for example by steering students into work experience placements and research activities in local businesses (mainly SMEs), and by undertaking contractual development activities and contractual education (on demand).

Companies expect higher professional education and the adult education and training systems to keep in close touch with developments and to take account of them in their courses. The education system is expected to contribute both basic initial education and specific training in response to specific changes in practices within particular companies, industries or occupational groups. Society expects education constantly to adapt to changes in the workplace and in the economy.

Society regards education (both initial and further training) as important, but primarily in relation to clearly defined economic goals. Expectations of the education system do not extend to combinations of working, learning and caring. More flexible pension arrangements and differentiation of social security to facilitate the independent development of career breaks and a better distribution of work throughout life are not part of this scenario. They may occur, but if so will do so primarily in an economic context. Education plays no part in them.

Government recognises a responsibility both for initial training courses and for further job-specific training. Government, national bodies and industry bodies work together on the choice of courses, the structure of qualifications and dual training systems (combining in-company training with part-time schooling). Many initiatives are taken by alert companies and effective industry organisations. Regional structures of coordination and regional training centres ensure coordination between different industries.

Companies themselves provide training, in partnership not only with higher professional education colleges and adult education and training institutions, but also with private sector training organisations. This means that there is little interest in targeting special groups, such as first- and second-generation immigrants, the low-skilled and older workers, so long as there is an adequate supply of workers with high qualifications and specialist skills. Industry invests in the 'problem' groups only to resolve a shortage of workers in a particular category.

Social scenario 3: The secure society

Developments in the social security field make education an increasingly important component of social security. The social security system is directed less at simply providing incomes and more at equipping people for employment. In this scenario, however, this is confined to general qualifications. There is no actual structure to optimise interaction between companies and schools. Education is primarily regarded as important in relation to social aspects of the combination of working, learning and caring. Education is, as it were, the link or glue between work and family responsibilities, and is viewed in the light of that function. The education system is not seen in the first instance as contributing directly to the economy in co-production with companies.

Society expects the education system to be open-minded about the place of education in the lives of individuals and requires it to target all the various phases of human life. The business world is not particularly interested in a direct partnership with education.

The reform of the welfare State brings a marked change in emphasis from the passive provision of incomes for the unemployed to an active and activating stance on the labour market. This results in a tripartite social consensus and cooperative action aimed in part at getting the low-skilled into subsidised employment. This policy is backed up by limited cuts in employment-related benefits and a stepping-up of financial incentives. The educational facets of this approach relate primarily to social security and are not to any great extent formulated or structured in response to economic developments.

The education system is expected to provide a solid basic training (broad employability) and to formulate a range of further training opportunities and individual care/work arrangements based on the educational aspects of combinations of care and work.

Labour organisations are perfectly prepared to provide training in order to increase employability. There is an increasing demand for knowledge, while the number of new entrants to the labour market is declining because of the ageing population. For that reason, it is to the advantage of labour organisations to provide training for all categories of workers, even those who generally receive little training, such as the low-skilled, older people and first-and second-generation immigrants. Collective labour agreements made by the social partners with government backing include provision for training facilities for people in work. Government acquires a greater role and responsibility regarding the training of people in work and is heavily involved in efforts to improve the quantity and quality of work/care/training combinations.

Individuals are also expected to invest in their own development. Workers interrupt their careers or reduce their hours of work in response to the presence of working partners, family responsibilities, pressure of work or a desire for sabbaticals. Working and learning are combined or alternated.

To prevent individualisation producing a social divide, public sector education is endowed with social responsibilities. Society expects the education system to make provision for people from disadvantaged backgrounds who began their adult lives with fewer skills on which to build their own career portfolios.

Social scenario 4: The pick-'n'-mix society

The emphasis in the previous scenario was on social and educational security. Government played an important part in this. In this fourth scenario, however, there is no standard solution. Society offers many kinds of solution side by side and these are of varying use to consumers. Variation and diversity are more important than security.

The education system is expected both to help establish a good social basis and at the same time to contribute to the practical development of skills along lines formulated by companies, either alone or in interaction with training institutions.

A much more flexible and individualised pension system is created to promote worker mobility and facilitate the alternation of working, learning and caring. This system is primarily geared to current and expected future trends in industry. Differentiation in social security provides additional encouragement for individuals to operate as active agents in the labour market and to alternate periods of work, education and care. It is left to individuals to decide what combination they prefer, and government has no role in this.

Society has high expectations of education, both economically and socially. From the economic point of view, there is expected to be a strong focus on knowledge transfer. The education system is expected to use regional networks to gear the knowledge and skills of students to meet the needs of the local labour market. It is also expected to contribute to the development of new knowledge.

From the social point of view, society expects the education system to make provision for those wishing to alternate working, learning and caring activities. An essential feature of this scenario is that economic and social aspects are in no way separate. However varied, expectations form an integrated whole. Economic and social demands blend together and must be coordinated within education (including initial and further vocational training). Precisely because of this interaction between economic and social demands, expectations regarding education are extremely diverse.

Workers themselves are responsible for keeping their knowledge and skills up to standard and so increasing their own employability. This is particularly true of workers taking career breaks or switching temporarily or permanently to part-time employment, for example to spend more time with their families. Variety is the name of the game.

The diversity of the education on offer is also reflected in contracts drawn up by companies with regional training centres, colleges of higher professional education and private sector providers (increasingly including temporary employment agencies). Employment agencies play a major role in coordinating supply and demand. In addition to their traditional intermediary role, they focus increasingly on improving the skills of potential and current staff through the provision of counselling and support in the training field.

7. Construction of educational strategies

The development of 'educational strategies' was based initially on the reasons given by respondents during the first and second round of questionnaires for the scores they awarded to developments relevant to the two dimensions of the scenarios. In other words, the basis was provided by reasons given concerning those trends, which were among the factors used in the process of constructing the scenarios described above.

These reasons were reduced to two dimensions. In the first, education is primarily an instrument used to achieve other aims of society, or education has primarily set its own goals and striven to achieve them. In the second, education is either pre- or post-structured. At present, government educational policies and legislation in all European countries are based mainly on the idea of pre-structuring, but this is certainly not the only possible educational strategy. Diagram 3 shows the four possible educational strategies.

The following four educational strategies were constructed on the basis of this model:

1. Basic education (pre-structured, determining its own goals).
2. Independent education/learning (post-structured, determining its own goals).
3. Recurrent education (pre-structured, instrumental).
4. Integrable education (post-structured, instrumental).

Unlike the societal scenarios, the educational strategies are of course drafted from the point of view of the education system. This means that they address the nature of the education provided and the identity of the provider.

Educational strategy 1: Basic education

Public sector vocational education focuses on foundation training and the first stage of further training for the workplace. This initial training is heavily structured, with set attainment targets and learning pathways leading to nationally approved qualifications. The education system knows best and formulates its own objectives. It does, of course, take account of the requirements of society, but the fact that this form of education is intended to provide a lasting basis means that priority is given to the system's own teaching aims.

Public sector vocational education concentrates on initial training with the aim of giving pupils and students the best possible preparation for a first job, to ensure a smooth transition from school to the workplace. The level of ambition is high: the best possible initial qualification so that college-leavers are well trained when they enter the labour market. The initial qualification is not job-specific, but is tailored to a particular industry or occupational area. It offers entry to a range of occupations.

The aim of public sector vocational education is therefore firstly to guarantee students a good start in their careers and secondly – and less importantly – to equip them to cope with changes in the labour market. Higher professional education and vocational and adult education and training are the initial forms of training, a basic form of social provision required to create the best possible chances for all. A high level of participation in education is also important to maintain the economic prosperity of the Netherlands. Access for all is a primary aim. Young people from underprivileged backgrounds need more attention and support but must also be enabled to enter the labour market with good basic qualifications. That is a social function, which the market cannot fulfil. The institutions expect government to continue to fund this kind of initial vocational education.

With post-initial training, the position is different. Higher professional education and the adult education and training fields see no role

Diagram 3 'Educational strategies'

		Institutional structure	
		Highly pre-structured	Mainly post-structured
Instrumentality	Instrumental for own internal educational objectives	1. Basic education	2. Autonomous learning
	Instrumental for external educational objectives	3. Recurrent education	4. Integrable education

for themselves in training subsequent to initial vocational education. Specialisation (specific training for particular occupations or jobs) is left to in-company trainers and private sector providers. The returns on post-initial education accrue to the company and the individual worker, so it is up to them to take responsibility for further training and make their own investments in it.

At system level, this strategy means that there is no competition between public and private sector provision. The two sectors are more separate than under any of the other three strategies. The public sector system takes little account of market demand and cooperation with the business world is very limited. Accordingly, dual training systems are not popular under this strategy. The risk of dual training is that it tends to lead too much to specific training for particular jobs.

Higher professional education and the adult education and training fields are reactive rather than proactive. They are involved with innovation only where it impacts on initial training courses.

Educational strategy 2: Independent education/learning

Under this educational strategy, pre-planned programmes and courses are relatively unimportant other than in initial vocational training. It is often only apparent in retrospect which programme is relevant and the best person to decide this is the trainee or client. There is little point in establishing an extensive system of consultation and communication. The important thing is to ensure a broad, flexible range of provision from which consumers or clients can choose whatever seems most useful.

Public sector vocational education is active in both the initial and the post-initial phase.

The public sector vocational education system also has a strong focus on post-initial education. It sees workers seeking further training as a growing market. In both initial and post-initial training, the higher professional education and vocational training and adult education fields focus on, and are strongly influenced by, the business market: individual companies, industries and professional associations. The role of the national bodies at the interface of industry and education is extremely important in this respect.

An ongoing dialogue between the education system and the various industries ensures the development of a flexible supply of post-initial training courses which can be taken in many different ways and which reflect the rapid changes occurring in the workplace. At curriculum level, this leads to the introduction of modular programmes, more flexible choice of subjects and individual learning paths.

A wide variety of dual training systems is established, like the present guild scheme for higher professional education, cooperative education and the small business route. Each variant presents different opportunities depending on the needs of trainees, institutions and employers.

Educational establishments offer a wide variety of training paths. In order to operate successfully on the knowledge market, the senior secondary vocational education and higher professional education institutions have themselves to attract funding. They attempt to win as many contracts as possible for contract education and research. The resulting resources are used to enable them to offer a flexible range of courses from which independent learners can make ad hoc choices.

At system level, this commercial orientation produces competition between the various types of education and between public and private sector providers. For private sector providers, post-initial education is an interesting market, while companies also provide inhouse training for their own workers. Vocational and adult education and training and higher professional education invest heavily in regional networks, particularly by entering into relationships with flexible, innovative companies in the small and medium-size business world. Institutions in the vocational and adult education and training and higher professional education fields seek to work together to provide the most flexible and client-oriented possible response to training needs. Clients tend to chop and change, so there is little point in long training paths.

Educational strategy 3:
Recurrent education

The key terms for public sector education are 'modularity' and 'lifelong learning'. Education, whether initial or post-initial, is instrumental in whole-life planning and in ensuring a smooth transition between the different phases of life and an easy alternation of periods of working, learning and caring.

Both initial and post-initial education are based on socioeconomic needs and are instrumental in reforming business processes and the structures of production. With a view to the rapidly changing labour situation, initial education sees it as part of its responsibilities to lay the foundations for lifelong learning. To achieve this, pupils and students must be taught the necessary interest, attitude and learning skills. Learning to learn is therefore an important concept during initial training: mastering the skills required for the independent acquisition of new knowledge and skills.

In addition, public sector education creates a set range of courses designed to assist people at a particular stage in their lives. These may be directed at entry or re-entry to the labour market, providing further training for those in work or improving general education and assisting personal development (for example, literacy, civics, or a second language). The relevance of the courses is clearly indicated in advance.

Public sector education sees itself as playing a social role. It develops a good range of courses for underprivileged sections of the population or groups towards which the business world feels no responsibility: for example, the unemployed, older people, low-skilled and first- and second-generation immigrants. This is particularly true of the adult education and senior secondary vocational education fields. They develop combined programmes of working and learning with intensive support, designed to qualify underprivileged individuals for the labour market. These programmes are clearly structured and directed at social goals.

At system level, this strategy means that there is only limited competition between public sector and private sector education. So long as public sector education focuses on disadvantaged and less affluent groups, it need fear no competition from private sector trainers. There is, however, some competition in the market for the retraining and further training of those in work.

With regard to the knowledge economy, vocational and adult education and training and higher professional education see no major role for themselves. They cooperate with industry on the development of post-initial training designed to keep the knowledge and skills of workers up to standard, but are more reactive than proactive in this area. The prestructuring of education means almost by definition that curriculum development plays a more or less reactive and reflective role.

Educational strategy 4:
Integrable education

Education, including initial and further training, is organised in such a way that it offers countless retrospectively valuable opportunities to respond both to the rapid and vigorous economic changes taking place and to the present and future personal situations of trainees. The education system gears its learning paths to this and serves both economic and social purposes.

Under this strategy, there is less emphasis on fixed initial qualifications than under the other three. Education, including both further and initial training, is organised as flexibly as possible to provide a rapid and satisfactory response to the changing needs of society and of individuals.

Due to market forces, education becomes heavily demand-oriented: that is, industry and individual students have a strong influence on programmes. At curriculum level, this produces individualised learning paths designed to meet the needs of a variety of target groups.

Education seeks not only to play a role in the transfer of existing knowledge, but also to contribute to the development and dissemination of new knowledge designed to promote economic growth. It feels itself instrumental in and co-responsible for economic innovation. To this end, the education system cooperates with other knowledge institutions, industries and innovative companies in the region.

At system level, this strategy more than any other, produces sharp competition, both within public sector education and between public and private sector providers. The vocational and adult education and training and higher professional education fields have to compete with a host of private sector providers developing courses to meet the educational needs of both companies and individuals. These providers target the entire market, including both initial and post-initial education. The industry organisations have their own training institutions to guarantee a supply of good staff. The companies are also keen to keep control of training via in-company courses.

To withstand the competition, regional training centres and colleges of higher professional education seek many kinds of joint working arrangements with the private sector. Public–private partnerships appear: centres offering classroom and other training. The regional training centres and colleges of higher professional education set their own goals in this respect. They seek combinations of activities, which they think will enable them to provide the most effective response to society's needs. The nature of these combinations is not predetermined. The consumer (the company or individual trainee) decides what is useful for particular socioeconomic purposes.

8. Construction of policy/administrative strategies

Experts from the fields of policy and administration were asked to rate trends in this area in terms of certainty and importance. Analysis of the answers revealed a number of dimensions for the construction of administrative strategies.

The administrative strategies were based on the one hand on the implementation of functions regarded as essential either by the market or by government, and on the other on a view of policy as starting either with the individual or with the institution or institutions. Expressed as a diagram, this gives us the following.

The four policy/administrative strategies can then be categorised as follows:

1. Controlled consumption of education
   Policy starts with the participants/target groups; the focus is on individual participants and the State guarantees basic functions.

2. Promotion of autonomous institutions
   Socially responsible institutions; the focus is on institutions and government guarantees basic functions.

3. Free consumption of education
   Competition is the ordering principle; the focus is on the individual consumer and basic functions result from market forces.

4. Leave to administrative bodies
   Functional administrations for different parts of the country; the focus is on institutions, there are no central guarantees for basic functions and the administrative structure is based on functional administrations for different parts of the country.

Diagram 4: Administrative strategies

	Starting-point for strategies	
	Individual/Consumer	**Institution**
Functions guaranteed		
By government/State	1. Controlled consumption of education	2. Promotion of autonomous institutions
By the market	3. Free consumption of education	4. Leave to administrative bodies

Policy administrative stategy 1:

Controlled consumption of education

Under this administrative strategy, policy starts with the individual consumer, but there are also central government guarantees for basic functions. In that sense, there is strong central government control. The Education Ministry plays a major role. It remains responsible for ensuring an adequate uptake of education. A proportion of educational funding is transferred from institutions to participants (for example, via education vouchers or training credits). This means that institutions providing higher professional education, vocational training or adult education must prove their worth by supplying products that represent good value for money.

But education is not left entirely to market forces. The Ministry has a very direct interest in seeing that certain target groups are properly served. A considerable amount of centralised control by the Education Ministry remains necessary to ensure satisfactory educational provision for the disadvantaged. This kind of socially desirable initial and further training is primarily in the hands of the regional training centres.

Privatisation increases, in the sense that there are increases in the proportion of school budgets, which is not funded by government/the Education Ministry. It is not unusual for institutions in the higher professional education and vocational training and adult education fields to have to seek their own sources of funding for almost half of their budgets. Controlled consumption of education creates the demand for this kind of provision.

The change to funding participants may lead to a form of 'performance-related' system (earning credits). The disadvantaged must also be given access to good education. Policies for this have to be developed. Political control via the purchasing of services for the weaker sections of society will be extremely important. A government exercising more selective control will continue to see this as its responsibility.

Policy administrative stategy 2:

Promotion of autonomous institutions

This administrative strategy assumes the development of socially responsible institutions. Over the last decade, the Ministry of Education, Culture and Science has favoured this kind of strategy. Institutions are comparatively autonomous and set their own sociopolitical priorities with regard to the groups they wish to target within society. The institutions are aware of their own importance to the regional economy. They focus on the demands of the market, but set sociopolitical priorities too with regard to target groups within society. Consequently, they offer a varied range of educational provision in response to perceived needs.

The Education Ministry supports and monitors these processes on the basis of its supervisory responsibilities, ensuring in particular that institutions actually fulfil the basic functions for which they are responsible.

The institutions are responsible for their own management expertise and develop strong regional links. Their supervisory boards include members with a broad range of social experience as well as management specialists and representatives of the main regional bodies. Social liaison within the region is also organised via a regional consultative structure or advisory committees from the different sectors of industry.

Government mitigates competition, ensuring that it is never totally free. Senior secondary vocational education remains primarily a matter for public provision. It is important for the regional training centres and, to a great extent, for the colleges of higher professional education to make more strategic choices with regard both to the curriculum and to the organisation of teaching. In order to ensure that this meets market demand and other needs within the region, there must be a substantial degree of autonomy and government policy will encourage this. However, that autonomy will always be contained within a government framework.

Policy administrative stategy 3:

Free consumption of education

Under this administrative strategy, the Education Ministry pursues a type of educational policy, which has much in common with the general policies of the Ministry of Economic Affairs with regard to other goods and services. That is to say, education is no longer regarded as in any way special, but rather as a set of goods and services like any other. The only remaining matters for government policy are economic aspects such as promoting competition, preventing monopolies, guaranteeing freedom of information and protecting consumers.

Should government decide to intervene at all in the market, it will do so purely as a regulatory authority and not in pursuance of its own aims. The Education Ministry will probably continue to be the main contractor/client in a few areas. Via this role, it will retain a number of responsibilities, such as safeguarding ethical standards and access, providing for the disadvantaged and preventing premature school-leaving. Otherwise, market forces will tend to dominate.

Higher professional education colleges and adult education and training institutions are no longer subject to educational legislation, but operate as companies and have that legal status. As such, they implement programmes, which may be contracted and funded either by the Education Ministry or by participants and companies. Higher professional education, senior secondary vocational education and adult education and training must all expect increasingly to forfeit their protection from competition and to experience increasing pressure from consumers in a position to exercise unfettered choice in the marketplace.

This means both increasing exposure to competition and increasing autonomy for the higher professional education colleges and adult education and training institutions. This is necessary simply to enable them to respond to this free consumption of education and training.

Policy administrative stategy 4:

Leave to administrative bodies

There is a steady increase in the scale of administration. Eventually, there will be separate administrations for different parts of the country, each governing a number of regional training centres or higher professional education colleges. Such centres and colleges will be less schools in the traditional sense than combinations of schools or teaching units under one roof. They will be governed by functional administrations for particular parts of the country. This may eventually have the side-effect of creating monopolies which will inhibit flexibility.

To promote the free play of market forces, it will be desirable to involve clients in this development, for example via tripartite administrations.

Rather being for a particular part of the country, some administrations might be organised along denominational lines or be cross-border authorities. The latter could be particularly important for the border areas.

Funding no longer goes to individual institutions, but to the administration for the particular part of the country. The Education Ministry liases with these bodies and some of its responsibilities are transferred to them.

This type of administrative arrangement requires some degree of supervision at national level. The Ministry continues to play a part in monitoring developments but the division of the country into area authorities means that many of its present tasks will disappear or be transferred to these functional administrations for the different parts of the country.

9. Conclusion

Experiences with the scenarios and strategies thus far reveal that the main features of the scenarios and strategies were credible to the field. Further details were then added in the course of the dialogue. This is likely to happen in all further discussions and, in that sense, the scenarios and strategies will never really be complete. The assessment of strategies in the light of the scenarios has, as was intended, produced a clearly structured strategic debate. The confrontation between the societal scenarios and the educational and administrative strategies helps to increase and sharpen understanding both changes in the social environment and possible strategic responses to them.

The relevance of the different strategies can be worked out in more detail within the four scenarios. In this way both strategies and scenarios can acquire a sharper focus and more reality value. Pictures that we construct like this can be used as a compass for the organisation of vocational education and adult education. Cedefop is envisaging an application of such a Scenario method for a European wide comparative analysis including a number of EU Member States and a number of central and eastern European Accession States. Such a comparison, however, will have to include at first a common country specific analysis which in the following (or may be in parallel) will have to be completed by a common core or roof.

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VII. Activities of Cedefop's network for research cooperation on 'European trends in occupations and qualifications'

Chapter VII refers to work currently being carried out by **Cedefop's thematic network, Ciretoq**, that has not already been mentioned in the articles in this volume. The network's objectives, working methods and work topics are described for readers who know little, or nothing at all, about it. In addition, there is a short interim report on work currently being undertaken by the network and findings, together with a list of publications. Then, last but not least, is a summary of the findings of some of the projects being carried out, on various topics. Information concerning member institutes and reports published by the network is available on Cedefop's home page: **www.cedefop.eu.int**, which is updated on a regular basis: The 'Ciretoq-Newsletter', published twice-yearly, is available (only from Cedefop), free of charge. It is also available electronically, via Cedefop's home page.

A. Aims, working methods and subjects

Stavros Stavrou (1)

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1. Preamble

Ciretoq was set up by Cedefop at the beginning of 1995, while the Centre was still in Berlin, and became operational in the same year.

At the heart of this initiative was the desire, which emerged after prior consultation, of the EU-wide vocational training research institutes and foundations, as well as within Cedefop itself, while taking into account the preparatory work and programmes at EU level (2):

- to take stock of the new approaches and the questions raised in examining trends in the development of occupations and skills, in particular in relation to the development of supply of and demand for skills and qualifications;
- to aim towards the joint compilation of corresponding results from several Member States or at European level by making use of transnational and comparative studies;
- to give advice on the policy and practice of vocational training and to examine related issues more quickly and effectively, in order to find the best possible response to these issues by taking into account the above trends, or subsequently to follow them up as part of the institutes' and Cedefop's research work.

2. Cedefop's aim

Cedefop's aim was to establish a network which would not be competing with other EU programmes and in particular the Leonardo da Vinci programme, which was just starting up at the time, but which would instead complement and support such programmes. Efforts were made to gather together material and methodical experiences and findings of the research institutes and institutions involved (3). The aim was to complement Cedefop's preliminary work in the observation, representation and comparative studies of the systems for providing skills and awarding qualifications, of supply and demand for skills, the way jobs change in response to the spread of new information and communications technologies and the socioeconomic, cultural and environmental challenges. Finally, it was also to help promote the development of new job profiles and the discussion of joint standards on, *inter alia*, the structure of training levels, both within individual Member States and, as far as possible, in comparison with a number of countries and at EU level. An ongoing cooperation between research institutes with the participation of major employers and representatives of the political and social fields, including the participating institutions and bodies at European level (the European Commission, ETF, ETUC and UNICE) should aim not only to promote an exchange of interests between employees and employers, researchers and those using the research results; it should also, from the outset, prevent the duplication of work and enable European bodies to carry out studies that complement one another.

It was not and is not Cedefop's intention to set up a network for immediate research purposes. Cedefop did not, and still does not have, sufficient means to do this, even if its projects were grouped together in some way. Many more preliminary studies need to be initiated and supported by the assessments of more or less parallel research work, with the aim of publicising and disseminating the results obtained and increasing the chances of their having an effect on the policies of decision-makers, including the social partners. This aim also coincided with the interests of the participating research institutes (cf. Newsletter 1/96). What was new, however, was the attempt not only to foster collaboration between the research institutes, on an ad hoc basis, for specific subjects and projects, but also to ensure their inclusion in discussions of new topics and methods in the context of the overall topic, to build partnerships between them and to enable solutions to be found to certain issues within their extended autonomy.

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(1) Deputy Director of Cedefop

(2) Eurotecnet: studies on skills needs, DG XXII; medium-term employment forecasts and studies on instruments and methods for the analysis of vocational training policy, DG V; socioeconomic research under the fourth framework research programme, DG XII, etc.

(3) Cf. updated list of network members on Cedefop's home page: www.cedefop.eu.int

3. Methods

Plenary meetings of all members of the network are held on an annual basis, and are attended by around 45 people. In addition, three working parties have been formed, referred to as groups A, B and C.

Group A is primarily concerned with the study of macroeconomic developments and the interface between labour market developments and education and vocational training. It focuses in particular on the development and structure of systems with regard to the supply of and demand for skills and qualifications. Group B deals with microeconomic studies of a more qualitative socioeconomic, job-specific, regional and sectoral (or even enterprise-specific) nature. Finally, Group C examines trends from the sectoral standpoint and that of related institutional structures, illustrating its work with examples from certain employment and vocational training segments.

Each of the groups examines phenomena and issues which may give a clearer understanding of a) the advantages and disadvantages of certain structures in training and further training with regard to professional practice and employment, and b) recent developments in the labour market and in the context of work organisation, personnel policy within the enterprise, etc., against the background of present and future challenges. Such challenges may be of an economic, social, demographic, cultural or eco-technological nature.

Particular emphasis is placed on the observation of innovative practices, the analysis of new demands at the workplace and new skills requirements and their repercussions on training and vocational training systems, as well as the way in which responsible institutions at all levels of political intervention react to new challenges.

4. Conclusion

The work of Cedefop's thematic network has not only proved successful, as is made clear by the publication of this work, but it has also had a knock-on effect on other approaches in the development of closer cooperation between research bodies at European level, for example, in the context of the socioeconomic part of the EU-sponsored fourth framework research programme and in the extrapolation of the studies and analyses carried out under the Leonardo da Vinci programme (4). The Cedefop network thus makes an important contribution to the development of a European research culture in the field of vocational training.

In a certain sense, the publication of this reference document marks the conclusion of the network's first period of operation. Correspondingly, it represents a review of the results achieved so far. Through a flexible adaptation of its working methods and work topics to evolving issues, and with the help of the network, Cedefop intends to continue in the coming years to make a constructive contribution to this subject at European level, and to support discussion and action in the Member States.

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(4) Cf. the corresponding contributions in this volume by Michael Kuhn and Erhard Schulte, and by Marc Ant and Jeff Kintzele.

B. Current activities and outcomes

Burkart Sellin (¹)

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1. Preliminary observations

The network has undergone a certain consolidation in the last two years and has become an important work forum for Cedefop and the participating institutions. Interest in research from the Member States of the EU and the countries of central and eastern Europe has increased. They are increasingly willing, on the basis of specific questions and in partnership with researchers and relevant institutions from other countries, to bring to their own research a transnational or European dimension.

Today, no European country can afford to ignore what is going on outside its own backyard with regard to trends in vocational training policy. In this context, research into vocational training and the labour market to some extent leads the way in terms of both policy and practice in vocational training. As the contributions to this volume make abundantly clear, the latter faces enormous challenges arising from the internationalisation and 'Europeanisation' of the problems and from the fact that work, production and life itself are changing increasingly rapidly within Europe and indeed throughout the world. Any attempt at a solution must take into account the experiences of other countries and regions if it is to be sustainable in the longer term at home.

The instruments and methods available for comparative and transnational research on vocational training have improved considerably in recent years. The tools of comparative statistics, empirical methods and qualitative methods can all be used and, with the aid of information technology, are being used with increasing accuracy and validity.

This is particularly true of research into the links between education/vocational training and the labour market, which are the focus of attention among politicians and practitioners and therefore within the network. The members of the Cedefop Management Board representing the governments of the Member States of the EU, employers' organisations, trade unions and the European Commission devote considerable attention to this subject. For their part, researchers are keen for their findings to be used to visible effect in policy and practice in the EU and in individual Member States. Cedefop would appear to be a suitable forum for this, both for researchers and those involved on the policy/practice side.

2. Study subjects and findings

However, many of the challenges which come up again and again can only really be tackled if they are examined in depth on the basis of very specific questions, and this is precisely what is done in the three working parties and within the framework of the specific research partnerships of the network.

The report from spring 1997 presented the interim and final results achieved up to then (²). An updated overview of findings and studies still under way reveals the breadth of the range of subjects and approaches of the research partnerships (cf. Annex in volume I). This overview and a number of contributions included in the present volume (³) demonstrate clearly where the

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(¹) Coordinator of the Cedefop network on European Trends in the Development of Occupations and Qualifications.

(²) Cf. Cedefop, Burkart Sellin, 1998, Interim report on research cooperation on trends in occupations and qualifications in the European Union (trilingual, i.e. also in DE and FR).

(³) Cf. the following contributions in the present volume: Borghans, L. and de Grip, A.; Brugia, M.; Gatti, M. and Tagliaferro, C.; Gay, C.; González, L.

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emphasis lies in the network's work. Important results were also evaluated in Volume I.

Taken as a whole, these findings constitute a puzzle to which a few more pieces can be added thanks to the present publication. The most important subjects covered and for the most part resolved thereby are the following:

European and transnational labour market development with regard to qualifications, skills and occupational structures;

The possibility of substitution in respect of certain qualifications in the labour market and the productivity and/or flexibility of certain education and training system structures and/or architectures;

New occupations and occupational profiles in the face of changes in production and services, on the basis of certain sectors and occupational groups;

Sectoral and regional support in the development of forward-looking economic, competition and employment policies;

Development of occupations and skills in the context of the expanded use of new information and communication technologies;

Job, occupation and/or skills development in the field of environmental protection;

Methods and instruments for the classification of occupations and training, the establishment and further development of training and qualification stages in the European context;

New and/or additional qualifications at the interface between initial training and further training;

Technical economic qualifications at senior secondary level;

New techniques and skills requirements in the banking and insurance industries.

There is also a series of studies and findings concerning institutional and methodological issues.

The findings and partial results of the network are all available and are disseminated using Cedefop's own print media or electronic means (4). The response received from researchers and those in the field is highly promising.

3. Conclusions

The systems and institutions in the field of education and vocational training suffer on many fronts from a structural deficit of flexibility and adaptability. The research findings are clear and the consequences of the trends are generally predictable. Admittedly, it is difficult in the short term to change established institutions and rapidly bring them round so that they can face up to the new challenges, particularly in the field of education and vocational training, where structures are by their nature conservative.

The Cedefop network would like to play its part in this exercise of persuasion as to the need for innovation in an objective and empirical manner, with built-in quality assurance, that is to say in a scientific manner. All those individuals and institutions involved must be open to the new challenges, though there should be no rigid insistence that the individual must adapt; rather, all concerned should be included in the process of change. The pressure for change should not be borne solely by individuals, as is so often the case today. Where change is required, it is society's institutions that should change first. The attitudes and patterns of behaviour of individuals can then also change in their turn.

Nor should short-term demands be allowed to obscure medium and long-term trends. Contradictory trends must also be accounted for, just as instant analysis should be resisted. The development of new education and vocational training opportunities, occupations and occupational profiles must be sustainable in the long term but that does not mean that we can continue 'as before'. The current symptoms of socioeconomic and cultural crisis cause politicians to look for areas where they can act effectively. Education and vocational training undoubtedly fit the bill. However, these areas should not be asked to do too much, which lies outside their traditional remit. Social policy, employment policy, economic policy, policy on young people, adults, families and women, to name but a few – all of these lay down important preconditions which must be observed by policy on education and vocational training. It should also be remembered that not all the problems associated with these areas of policy can be solved through education and vocational training policies, even if the latter can, under certain circumstances, make a significant contribution.

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(4) Using the Cedefop Internet homepage and the Electronic Training Village opened in 1998.

Because by their very nature the effects of policies on education and vocational training, be they positive or negative, can only be felt in the medium to long term, such policies have the disadvantage that they cannot have short-term objectives. Politics, however, relies on short-term results, the next election is always just around the corner. On the other hand, however, a policy on education and vocational training which stresses social and cultural integration and social reproduction and innovation can have a preventive effect in that it can help to avoid problems which would be bound to occur in the above-mentioned over-ordered areas of policy if investments were not made at the right time, and with an eye to the future, in education and vocational training; indeed, this would appear to be what has happened recently in many EU Member States.

Of course, a *cultural revolution* imposed from above is impossible in a democratic society. Instead, work must be done to persuade people, change must be promoted; that change must not only be comprehensible to those affected, they must also have a direct interest in it, so that they are then prepared to make their own contribution, to play a part in the design of innovations in connection with and complementary to existing institutions, rather than simply having to put up with 'imposed reforms'. Only rarely will new institutions be required; what is more likely to be needed is the renewal of existing institutions, something which is much more difficult to bring about. However, as regards the continuous monitoring, analysis and evaluation of supply and demand in respect of occupations and qualifications, against a background of proactive economic and employment policies as regards careers information and guidance at all political levels, new or at least complementary structures do need to be created. These are particularly important at regional and sectoral level, as a number of the contributions to this volume underline. The mechanisms which allow theoretical understanding or practical knowledge concerning new occupations and occupational profiles or qualification requirements to be more quickly put into practice in Member States or regions also need to be improved or safeguarded.

C. Impact of information and communication technologies on occupational competences and VET (¹)

Mara Brugia (²)

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This survey – conducted in three countries, France, Italy and Spain – is the second phase in the survey conducted last year on the development of vocational competences associated with new information technologies in the telecommunications and administrative sectors.

The objectives of the second survey may be summarised as follows:

- verification of the findings of the previous survey
- forecasting future changes in the scenario for organisational arrangements and occupations
- identification of the main competences, present and future
- compilation and presentation of training typologies and actions.

The logic adopted in conducting the research was an attempt to find sequential replies to the following questions:

- what are the market trends, and how do they affect enterprises?
- what strategies do enterprises implement in meeting external challenges?
- what are the policies of enterprises on the adoption of technologies, and which do they choose?
- what organisational changes are entailed?
- what vocational changes are generated in terms of competences?
- what vocational training initiatives are set up in response to the new vocational needs?

Based on this logic, the work groups agreed to adopt a common questionnaire in gathering information on each of the aspects listed above. The national surveys were conducted by taking typical case studies, chosen in the light of their importance at national level and the degree of technological innovation adopted.

The synthesis report sets out and compares the main findings from the three national surveys. For a clearer understanding and presentation of trends in the factors under observation, the findings were divided into five blocks.

1. Technological development and changes in vocational skills

Trends were analysed in the two sectors, both in companies' markets and strategies and in organisational changes and the technological options adopted.

The salient findings that emerge refer to the organisation of enterprises, especially in the telecommunications sector, where the ending of monopolies is leading to large concerns being broken up into product-specialist companies with a high level of flexibility and far more attention to the customer. The impact on organisations is taking the form of a greater demand for flexibility, promoted by setting up work groups and networking the information handled.

(¹) Summary of findings of M. Gatti, L. González and C. Tagliaferro, 'Impact of information and communication technologies on vocational competences and on training' (provisional title). Synthesis report (not yet available).

(²) Cedefop project coordinator.

2. Impact of change on vocational macro-characteristics

Vocational changes occurring in the two sectors were identified, with special reference to emerging roles. The changes were analysed through a study of developments in competences, which were classified as two types: technical/specialist, and horizontal.

The main findings are set out in summary tables, which include interviewees' assessments of the competences currently required and their prediction as to the competences that will be needed in the future. The key horizontal competences were also identified, from which the vital importance of personal competences is apparent. Another important finding is on the new vocational roles emerging in the two sectors.

3. Future changes in vocations

Predictions are also included as to future changes in vocations in the two sectors as they are likely to develop in the light of current trends.

In particular, the need for new competences is highlighted, as is the integration of 'doing', 'being' and 'relating' in the formation of future skills.

4. Impact of technology on vocational training

Training requirements associated with the development of vocations and the role of new technological opportunities in training measures 'tailor-made' to the needs of enterprises and users are presented.

Of particular interest are the 'training spheres' favoured by enterprises in the measures they adopt, although of equal importance are the variety and inventiveness of new methods of providing training, for example 'action learning'.

5. Recommendations for the improvement of vocational training

Certain recommendations have been made, directed at the providers of vocational training (in other words those responsible for the planning of training), regarding more effective ways of developing training measures:

- to include the acquisition of key competences among the training objectives;
- to incorporate as an integral part of training the technologies with which the users will be working;
- to structure the provision of training bearing in mind that continuing training should be compatible with the differing status of beneficiaries: the employed and the unemployed.

The new role of training depends in practice on the ability to interpret new needs for vocational skills in production contexts and to translate them into fresh educational content. This should be done via a constant interchange between the working world and the training world, in which each one will have something to learn from and to teach the other.

D. Learning in microenterprises, some sectoral aspects (¹)

Tina Bertzeletou (²)

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1. Different learning situations within the sectors studied

Enterprises are confronted nowadays with fast and important changes to which they have to respond at a certain stage of their development. One of the means to govern the permanent process of change is through innovation of the qualifications of personnel.

It is commonplace in research literature that most training takes place in large and medium-sized firms, which practice an adequate personnel policy and even have a human resources' department. Contrary to this, however, only a small percentage of the 17.5 million SMEs in the EU are adapting their staff's skills by offering sufficient training.

Although training does not reach SMEs to the extent wished for by public training providers and the economic sectors they belong to, this does not mean that qualifications are not constantly acquired in these firms. This is even the case in the very smallest ones with fewer than 10 employees.

Cedefop's project on 'Work organisation and learning in micros' in three sectors, namely retail, car repair and printing, has confirmed that qualification development is located on the job and takes place at the workplace. Thus, opportunities for qualifications depend strongly on the organisation of work and the development of its structure.

Our study of a total of 57 micros has shown that a lot of learning is done by using possibilities available within normal daily work. This may contain formal and/or informal parts and take place in a structured and/or unstructured way.

Twenty-five different methods have been defined, ranging from learning new things under the responsibility of the chef or an experienced worker to learning by installing technical modifications on existing cars, in the case of the car repair sector or learning by doing jobs for yourself in your own time, in the printing sector.

In the car repair sector the five most common methods are, according to the employees, learning by solving problems oneself; learning solving problems together with colleagues; learning by rotating tasks regularly in order to keep skills up to date; learning new things under the responsibility of the manager or an experienced mechanic and learning new things by helping others.

In the printing sector, the first two ways of learning are most common, followed by learning by asking help/advice from an experienced colleague; learning by direct employee participation and learning new things under the responsibility of the manager or an experienced worker.

An important question is the learning potential of the various methods applied. The outcome of the surveys shows that the opportunities for updating and developing new skills are closely related to the way the work is organised within the firm.

In the car repair sector, the 60 mechanics who have been interviewed signalised that the most

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(¹) The present article is based on the findings of Cedefop's project 'Work and learning in micros, the case of some sectors', under the scientific coordination of ITS Nijmegen, The Netherlands. The synthesis reports in English are in the process of publication.

(²) Project Coordinator, Cedefop.

effective ways are, in order of importance: learning by performing non-routine repairs; learning by doing work with a growing degree of difficulty; learning by asking help or advice from the first mechanic and learning by explanation of experts or experienced people.

In the printing sector, learning by using handbooks/manuals etc.; learning by asking help or advice from the immediate superior; learning by solving problems alone; learning by doing work with a growing degree of difficulty and learning new things through the help of experienced colleagues, are the ways offering the best opportunities for skill improvement according to the printers interviewed. In the printing sector, employees can be divided into three categories: printers, desktop publishing (DTP) and after-press. Their work situation and functions within the firms allow for very different on-the-job learning opportunities. DTP employees have more opportunities than the other two categories, as they prepare their products in negotiation with the client on the one side and as they have to explore the different possibilities of hardware and software newly launched on the market on the other side.

In both sectors, employees with a formal initial vocational training participate more often in informal training than their colleagues with no initial training. There is also a noticeable difference between the methods of informal training used most frequently by those two categories of employees.

In the car repair sector the learning methods by coaching under the supervision/assistance of the manager or an experienced colleague are much preferred by mechanics without initial training to those based on problem solving alone, on regular rotation of tasks, on direct participation and on learning from complaints of clients, methods preferred by those with initial education.

In the printing sector, the situation is somewhat different, which has to do with the structure of the sector itself. The printer's profession is a very old occupation with a long education and training tradition of its members. In such professions, sectoral professional organisations and peer-groups play an important role for their development and for keeping their members up to date and it is the profession itself, which sets its quality standards. This is the reason for signalling as most frequent methods of learning the advice/assistance of the supplier as well as visits to similar enterprises.

Competence of the owners plays a dominant role in small enterprises. Our findings have confirmed this long-standing conclusion. A strong connection exists between the skills of the entrepreneur and his effort to promote the training of his staff and to modernise his firm.

Both entrepreneurial skills geared towards the external environment and managerial skills oriented to the internal functioning of the firm are necessary for the survival and especially for the growth and/or the modernisation of the enterprise. However, depending on the sector, we have noticed a varying importance of the skills of the entrepreneur. Whereas entrepreneurship of the owner was dominant in the microfirms we studied in the retail sector, in the printing sector there is evidence that managerial skills alongside qualifications help maintaining the position on the market.

In sectors which are subject to fast technological changes, as is the case with printing, it is crucial that qualifications of both owner and staff maintain a high standard of quality and low cost in order to remain competitive.

The design of an adequate personnel and training policy is part of the managerial skills of the entrepreneur. There is evidence that entrepreneurial skills dominate compared with managerial skills.

Among the three sectors in question the latter applies especially to retail, where the owner has to accomplish both management and administrative tasks. In times of stiff competition, as at present, there is a need for performance improvement both on the product-sales/service side and on the management/administrative side of the retail firms.

This implies that the traditional vertical separation of the two sides must be overcome and another work division and organisation should be adopted, permitting connections between the 'technical-commercial' and the administrative/management sides.

At present, the European debate on new job profiles follows the strict separation between the technical/vocational and the commercial/management fields. This separation may still be valid for large-scale retail firms, it does not necessarily correspond to the realities of the micros.

Results have shown that the internal processes of management and the development and use of craftsmanship depend to a large extent on the sector these micros belong to.

Among all important factors at sectoral level there is evidence that the degree of the sector dynamics and linked technological developments; the homogeneity or heterogeneity of firms, products and production processes as well as the sectoral training tradition and provisions, play a decisive role in those sectors and firms where employees' participation in training is concerned.

For instance, there is a relatively high percentage of participation in continuing vocational training in the car repair sector and a relatively low one in retail. The car repair sector is confronted with important technological changes. The same applies to the printing industry, especially to the pre-press and press phases which are changing due to the new electronic devices. Both sectors are relatively homogeneous, they often have their own training funds and institutions, and training is quite often an important part of respective collective agreements.

Contrary to this, the retail sector offers a different picture, as it does not have a great training tradition and is of a rather heterogeneous nature. Needless to say, this sector too has undergone important technological change, but this had more influence on back office employees in the large retail than on front office personnel in the small retail trade.

2. Intermediate level instances

Training and transfer of innovation at shop level is also provided by the intermediate instances which operate in the sector.

If one looks at the training provisions at an intermediate level, the picture in retail is somewhat changing, because with the voluntary chains formula, the wholesalers offer training to their retail members. And even if this form of cooperation was rather exceptional in the early 1990s, it now tends to develop into a more solid business relationship embracing all important aspects of operating a retail business, from product range and promotion to automation and more recently, to personnel policy as part of its marketing strategies.

Training provisions at an intermediate level can be found in the car repair sector too, even at an earlier stage than in retail. Car importers have their own training provisions specific to the brand and franchised car repair firms often get a lot of support in these matters. This is one of the reasons for which owners of microfirms in the car sector chose to become franchised.

Car sales are the main focus but car repair is still a relevant service and an increasingly important means to customer retention. Training of the mechanics is costly but it is considered a necessary factor for business growth, as people buy cars on the basis of the extras and the price quality relationship of the after-sales service.

However, although training is largely available in the sector, this does not mean that everybody has access to it. Indeed, training is geared to the mechanics of the franchised car workshops only.

Manufacturers and importers sell the high-tech make-specific diagnostic equipment exclusively to their own franchised dealers and only mechanics and technicians of the authorised workshops are entitled to participate in respective training courses.

In brief, skill organisation in this sector is strictly controlled. Besides, there is evidence that this type of training is tailor-made on the specific brand name and too operational to allow mechanics to work in workshops of different car makes.

In general, mechanics in franchised workshops have better possibilities to participate in continuing vocational training as they have an early access to the continuing vocational training CVT provisions of the manufacturer or the importer.

And if one takes into consideration that qualified car mechanics with initial vocational training are hired by franchised workshops, whereas mechanics without this type of training end up in non-franchised ones which tend to specialise only in certain types of repair as they are unable to keep up with the developments in all car makes, one can easily understand that the further learning opportunities of the car mechanics depend on the situation of the work and the labour market they enter in originally.

To remedy this, the profile of the mechanics should be reshaped to have a broader horizontal function as mechanics in the microfirms in the repair sector should be all-round.

The strategies of non-franchised workshops are typical of the sector and have consequences for the skill development. Increasingly, workshops opt for specialising either in mechanical or electrical repairs, competing only in price.

This strategy, however, is not in line with recent developments and more sophisticated training provisions, which tend to integrate mechanical and electrical/electronic skills. A new occupational profile for car repairers has recently been developed at the European scale: the 'mechatronic' car repairer and service mechanic, which tends to become more independent from individual car producers. Respective training provisions are being developed in a number of Member States. This profile could replace the traditional car repair mechanic in due course.

Others become more or less specialised in one specific car make and through contacts with local dealers or personal contacts they manage to keep up with the evolution of the equipment and tools and with training.

Finally, there are the workshops which have chosen deliberately to remain independent, because they have a large and stable clientele and wish to respond to all its needs, including the sales of various car makes. They develop a personal contact with their clients and offer a very flexible service. They hire qualified mechanics, who are in a position to update their skills easily by participating in courses and informal learning.

Obviously, a large clientele and sales number gives them a strong position in the area they operate in and the franchised dealers are more than willing to support them with help and advice, if they can deliver the cars which the non-franchised firms sell.

3. Conclusion

In the present article we have briefly referred to the interaction between the organisation of the work in the microfirms and the way skills and qualifications are acquired. We have highlighted some specific characteristics proper to the sector those firms are operating in and tried to see how they are influencing both the organisation of the work and the acquisition of skills. But this is by no means a one-way relationship. It is not only the entrepreneur/owner and the way work is structured in the firm that allow for learning.

Also the skills of employees, their creativity and readiness to explore new possibilities, is what can make a firm dynamic, especially in sectors undergoing fast change, as is the case with the printing sector.

CEDEFOP – European Centre for the Development of Vocational Training

European trends in occupations and qualifications
Findings of research, studies and analyses for policy and practice

Volume II

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